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THE BALTIMORE MEETING.

Allusion was made last week to the absence, at the Baltimore meeting of the Institute of Mining Engineers, of the public and private courtesies which have been heretofore extended to the Institute on such occasions by the citizens of the place. This circumstance was the subject of some comment by the Baltimore press ; and, for a while, caused no little perplexity in the minds of the officers and members of the Institute, particularly in view of the cordial invitation, signed by many leading citizens of Baltimore, which had been printed by the Secretary in a circular, and sent to every member. It is due to those gentlemen who signed the invitation that the *contretemps* which defeated their hospitable intentions should be explained.

The meeting at Baltimore was the first in the history of the Institute to be held in a city containing no members of that body. Consequently there was no one on the spot who could be in constant consultation with the gentlemen of the citizens' committee, and advise them as to the arrangement of a programme. The Secretary, indeed, made a special trip to Baltimore in advance, for this very purpose, and corresponded vigorously, without succeeding in obtaining the evidences of organized action. It is rather a delicate matter to instruct one's host beforehand how one wishes to be received ; and the Secretary very properly, after doing his duty in the premises, left the gentlemen of Baltimore to do as little or as much as they thought proper. They, on their part, seem to have concluded that it would be time enough to arrange their programme after the Institute had arrived. They accordingly made preparations for an address of welcome from the Mayor, and left other particulars to be settled by subsequent consultation.

Unfortunately, Mr. KAISER, of the Baltimore & Ohio RR. Co., who was the leading spirit, and to whom the matter seems to have been left, was called to Wheeling by a telegram, late in the afternoon of the day of the first session. The note which he sent to the Mayor, explaining the necessity of this sudden departure, failed, through a mistake on the part of the messenger, to reach that gentleman until the next day. Consequently, the Mayor, with his speech unspoken, waited in vain for Mr. KAISER to call, according to agreement, and take him to the meeting. The next day was spent in inquiries and consultations and telegraphic correspondence with Mr. KAISER ; and on the following morning (Thursday) the citizens' committee, thoroughly aroused and deeply mortified at the way in which every body's business had been done by nobody, called upon the officers of the Institute to see what could be done to repair the failures for which every body was a little, and nobody much, to blame.

But meanwhile, the Institute had proceeded rapidly with the transaction of its business. Tuesday night, a session ; Wednesday, three sessions ; Thursday morning, the fifth and closing session : and five minutes before the anxious delegation of Baltimoreans entered the hall, the meeting had gone to pieces *sine die*, and it was impossible to hold the members together for excursions or entertainments. A few, we believe, availed themselves of the special car furnished by the B. & O. RR. for a trip to Washington on Friday. Mr. MARTIN, the energetic Chief-Engineer of the Water-Works, was, when last we saw him, trying to find somebody to drive out with him to see the big tunnel and other interesting things. But it was too late ; and with much chagrin, the gentlemen of Baltimore were obliged to accept the situation, and suffer the slight which fate had put upon the traditional hospitality of their fair city. We are safe in repeating to them publicly the assurances already privately given, that the members of the Institute have no feeling on the subject save that of natural regret, to have missed the pleasure of a better mutual acquaintance, and a still stronger regret that the course of events should have been so mortifying to gentlemen ready and willing to make it otherwise.

The following is the text of the Mayor's intended address. It is neat and to the point, and makes us wish we had heard the Mayor deliver it :

GENTLEMEN : I have great pleasure in welcoming your Association to Baltimore. The profession to which you belong is closely connected with those works of public improvement which make large cities. For while natural advantages are sources of municipal greatness, those advantages depend upon engineering skill to render them available. In Baltimore we are especially indebted for our prosperity to the knowledge and ability of engineers. Our position at the headwaters of the Chesapeake, nearer to the great West than any of the cities of the Atlantic sea-board, would have availed little had not members of your profession thrown across the mountains those iron cords that tie us to our sisters of the West. But in this age of enterprise and progress, the usefulness of engineers is well known. The engineer and the architect are *entitled* to a municipal welcome: for are they not almost the creators of cities? Allow me to again express my pleasure in having you in Baltimore, and to hope that your visit may be an agreeable one.

This address, kindly furnished to a member of the Institute, was read by him at the annual banquet of the Institute on Thursday evening. The address and the explanation accompanying it (substantially as we have given it above) were received with applause by the members present ; and President COXE subsequently took occasion to express the friendly feeling of the Institute toward the gentlemen whose good intentions had been so unfortunately thwarted.

After the serious explanation referred to, the member who had read the Mayor's speech gave, out of pure fun, a new and garbled version of it, in which the ludicrous aspects of the matter were set forth. In reply to many requests for the publication of this production, we are authorized to say that the author declines to permit such use of it. The good-natured satire, which was permissible in a private company, might give unnecessary and unjustifiable pain to the citizens of Baltimore, if formally published. Moreover,

"Colors seen by candle-light
Do not look the same by day ;"

and members might find, on a calm perusal, that what passed for wit and humor under the favorable circumstances of after-dinner oratory, would not bear a closer scrutiny. Those gentlemen who, relying on their misty, post-prandial recollections, are kindly circulating the report that the speech in question was an "almighty funny" one, are hereby encouraged to persevere, and assured that they will not be brought to shame as historians or critics by the publication of the speech itself.

We print in another column the clever poem made by Mr. HOLLEY at the same banquet, and received with great applause. There were many good things said by the various speakers ; but the brilliant scene can not be reproduced, and, without it, the mere repetition of words would be in vain.

The one individual who secretly rejoices over the disappointment of Baltimore is he whose duty it has been for years past to "write up" in these columns the excursions of the Institute. To him a meeting without excursions is a balmy blessing. But, judging from the rumors which already fill the air about the Pittsburg meeting, next spring, the present interim of repose, so welcome to a weary pen and a dry inkstand, is to be followed by an outbreak of activity beyond all description. Pittsburg threatens to do all that Baltimore meant to do but didn't, and all that Pittsburg knows how to do besides. Could any formula be more nearly universal?

NEW PUBLICATIONS.

SECOND REPORT OF THE PENNSYLVANIA BOARD OF THE PENNSYLVANIA AND NEW YORK JOINT BOUNDARY COMMISSION. Harrisburg, 1879.

This Commission consists of Messrs. JAMES WORRALL, C. M. GERE, and R. N. TORREY, on the part of Pennsylvania, and CHAUNCEY M. DEPEW, HENRY R. PIERSON, and E. W. LEAVENWORTH, on the part of New York, the last-named gentleman having been appointed by the Board of Regents in place of Hon. J. V. L. PRUYN, deceased. Its object is two-fold: first, to retrace and recover the boundary between the two States, as determined by previous surveys; and, secondly, to ascertain the exact position of the forty-second parallel of north latitude, which, by original grants and by repeated enactments, has been declared to be the true boundary.

Unfortunately the bill appropriating money for the continuance of this work failed last year, for want of time, to pass the Pennsylvania House of Representatives; but New York having made an appropriation, operations were continued by the Board of that State; and no doubt Pennsylvania will bear her share of the expense, as she is in honor bound to do.

The field-work of the year was conducted by Capt. H. WADSWORTH CLARKE, of Syracuse, an engineer of deservedly high reputation; and the Pennsylvania Board, having repeatedly inspected the operations in the field, and received weekly reports through the season, express their complete reliance upon the results.

According to the previous report of the Pennsylvania Board, about 119 miles of the boundary, beginning at its eastern terminus, had been carefully traced, and four astronomical determinations of latitude had been made. Capt. CLARKE'S preliminary report of progress for 1878 shows that this investigation has been continued from mile 119 westward to mile 169, and from mile 184 to mile 224, which is the southwestern corner of the State of New York, and thence northward along the meridian to Lake Erie. A distance of 15 miles (mile 169 to 184), comprising the line between McKean County, Pa., and Cattaraugus County, N. Y., remains to be retraced. It was omitted as both less immediately important and more difficult than the other portions of the line, since it runs though a wild, forest region.

The preliminary work of this survey may be said, therefore, to be practically complete. Some further astronomical observations will be required; and it will be necessary to follow up the survey immediately, by replacing with permanent monuments the temporary stakes which have been set for reference. Then the boundary as run by the last survey, and practically accepted for nearly a century by the Land Departments of the two States, will have been recovered. But it will not be the true boundary, unless the States shall so decide; for it is far from coinciding with the parallel of latitude which legally separates them.

Captain CLARKE'S survey demonstrates, what was pretty certainly known before, that the boundary was rendered very inaccurate and irregular by the variations of the compass in the eastern portion, and by hasty and careless field-work in the western portion. Errors up to five eighths of a mile in latitude and 1107 feet in the measurement of a course of 3 miles, are found to exist. In many cases, the monuments and milestones have disappeared; in some cases, it is probable that no permanent monuments were ever placed. The southwest corner of New York was originally marked with a stone, set in 1790. This, being in the middle of a road, was broken by passing vehicles; and the place is now indicated by a birch-stake, a piece of sleigh-shoe, and some small stones, buried in the road. Of course, for the destruction of landmarks by time and man the former commissioners and surveyors can not be blamed; though their failure in many instances to set proper landmarks is reprehensible. Blazes on trees, or perishable stakes and movable cairns are preposterous monuments for such a line. As might naturally be expected, the line is for long distances entirely lost, and must be arbitrarily redrawn.

This state of things raises some curious and interesting questions. First of all, as a minor matter, yet one of no little embarrassment, how are missing monuments to be replaced if the object is, not to trace the 42d parallel, but to recover the crooked line laid down in the last century, and said to be that parallel? "We find," say the Commissioners, "no three monuments forming a straight line, nor any three forming a curved line like that which is formed by any other discoverable three consecutive monuments. * * * * The line is in no place either straight or systematically crooked. It comprises a continuous series of salient and reentrant angles, crossing the parallel of latitude in which it ought to lie for the whole distance."

We can think of but two ways to recover a missing piece of such a line. One is the *a posteriori* method, namely, to follow the nearest rail-fence, giving all doubtful territory to the State whose citizens have had the enterprise to claim and inclose it. But there may be no rail-fence handy; or the oldest inhabitants may be bitterly at variance concerning two rail-fences. On the whole, therefore, we prefer the *a priori* method, namely, to equip a surveying party in the tight breeches and cocked hats of the last century, furnish them with imperfect instruments, forbid them to use modern methods of precision, start them at one monument, tell them the next one is "over yonder," order them to get there as soon as possible, and take the chances that history will repeat itself. A man might be stationed at the objective point to "holler" occasionally, by way of correcting the magnetic variation. If the party should finally emerge from the woods a thousand feet or so out of the way, it would only be necessary to put a "jog" in the line, as the fathers used to do: witness the report before us. This method would reproduce the former line with some degree of probability, at least. One thing is certain: whatever may have been the course of the old boundary between two points now ascertainable, a straight line it was not. From the list of positions which it may have occupied, the one which it ought to have occupied must be excluded. The 42d parallel is the one line which does *not* constitute the boundary as marked by survey between these two States!

A more serious question arises as to the manner in which this subject shall be dealt with hereafter. Shall the crooked line which Capt. CLARKE has so laboriously reclaimed from oblivion be formally adopted, to be, perhaps, lost and recovered again, after another hundred years? Or shall the parallel be astronomically determined—as it can be, with present appliances, to within six inches—and adopted as the boundary in fact, as it is in law? No destruction or removal of monuments could obscure that line, laid down, as it would be, not only on the changeful earth, but also in the steadfast sky.

On the other hand, numerous vested interests, as well as questions of jurisdiction and taxation, have to be considered. We agree with the Pennsylvania commissioners, however, that the true and permanent boundary can be accepted, without disturbance of private rights. As the limit of individual ownerships now on the border of either State, the old boundary would remain a merely private line. There might be inconvenience, in many cases, arising from the taxation, part in one State and part in the other, of lands now lying wholly within either. But we see no special difficulty in providing, by suitable legislation, for all such cases. The sovereignty of each State ought, however, in our judgment, to be immediately extended to the true boundary. It is not certain, as yet, which State would suffer, on the whole, a loss of territory. The commissioners think the corrections thus far indicated would leave a balance in favor of Pennsylvania. But probably the total difference would not be very great; our fathers apparently zigzagged with praiseworthy impartiality. And, as these gentlemen very properly remark, the preponderance of error on the one side or the other ought not to be of the least consideration in a final settlement. We hope the border members of the two Legislatures will take an equally honorable and disinterested position. Capt. CLARKE, as becomes his official relation to the subject, declines to discuss the arguments as to the choice between the two boundaries, contenting himself with the thorough performance and the clear statement of his own work. *

PERSONALS.

Our Readers are invited to send us Items for this Column.

MR. D. G. CROLY has succeeded Mr. R. C. STONE as Secretary of the Bullion Club.

F. C. M., CRISMAN, COLO.—Smelting works, unless provided with condensing chambers and high chimneys, through which to carry off the sulphurous-acid fumes, are injurious to the crops in the vicinity.

The extent and richness of the Utah deposits of mineral wax, it appears, are much less than supposed; or, at least, their extent is less known than was imagined. We shall publish fuller details shortly.

Secondary Technical Education, about the influence of which Mr. ECKLEY B. COXE so thoughtfully and practically speaks in his opening address to the Institute of Mining Engineers, is well worthy the attention of all interested in the industrial future of our country, and to none is it more important than to the great coal companies. The enormous waste and losses incident to our present system of mining may find a preventive in more skillful miners and foremen.

There is a new hope springing up for the races of men. Experiments recently made upon a pigeon (not a stool-pigeon) in Philadelphia showed that not only did the bird live after the greater part of its brain had been removed—which confirms the general experience that in the higher types the individual can live without any brain at all—but the bird recovered its lost intelligence, and a subsequent examination showed that the brain had actually grown again and filled the brain cavity. This well-established fact should afford a world of comfort and hope to a large circle of our mutual friends.

Mr. H. C. GOODSPEED has been credited by the Western press with having made the statement to the Bullion Club relative to the Old Telegraph mine, that it had been sold in Paris for $3,000,000, and that he did not think it would net $100,000 in thirty years. In justice to Mr. GOODSPEED, we must say that he did not make the statement attributed to him, although it was made on equally good authority. We have seen correspondence from Paris bankers announcing the sale. At any such price our correspondents are unanimous in the opinion that the investment will be as disastrous as that in the Emma mine.

THE ORE DEPOSITS OF LEADVILLE.—II.

Written for the Engineering and Mining Journal, by Carl Henrich, E.M.

In our first article we have seen that the ore deposits of Leadville occur on the west slope of the Mosquito Range, east of the city of Leadville, between or in the strata of a mountain range formed by the sedimentary deposits of gneiss, quartzite, clay-schists, limestone, capped over by a thick layer of trachytic porphyry.

Going westward from Leadville, we pass over three miles of long-stretched, narrow foot-hills to the valley of the Arkansas. So far as disclosed by prospect shafts and wells, these foot-hills seem to be composed entirely of sand, gravel, and rounded boulders—probably the remnants of glaciers of a former ice period.

Crossing the broad valley of the Arkansas, we come to similar, only steeper, foot-hills of the Sawatch or Main Range, the divide of the waters of the Atlantic and Pacific oceans, the backbone of this continent.

Following one of the most accessible gulches, Lake Creek, we pass by the beautiful Twin Lakes, around which and west of which the higher and steep mountains begin. We notice at once the absence of the trachytic porphyry, so abundantly covering the mountain sides of the Mosquito Range; and we find the mountains formed by steeply-pitching strata of gneiss, cropping out everywhere on the steep sides of the mountains, and unhidden by any detritus. Numerous prospect shafts indicate the presence of many fissure-veins of quartz rock, impregnated in many instances with galena and antimonial silver ores. None of these shafts visited by me has been carried deep enough to allow of a characterization of these veins as true fissure-veins or as fillings of the contacts of the different strata of gneiss. While in one or two instances I have noticed the outcrops of small fissure-veins crossing the different strata of gneiss, doubtless a great many of these veins follow the contact of the different strata of the gneiss. I could find only one dike of porphyry at the lower part of Lake Creek, and am not sure of its crossing the strata of gneiss or being wedged in between them.

These strata of gneiss pitch 60° to 80° from the horizontal to the northeast. Sometimes they even seem slightly overturned, and then pitch very steeply to the southwest. Advancing farther west, we discover the cause of this steep pitch in the massive granitic dome of the Monitor Rock, rising some hundred feet in a solid mass above the bed of the creek. This Monitor Rock evidently forms an outcrop of the central body of granite of this mountain range. We find this range to consist of an upheaved central body of granite, around and above which the upturned strata of gneiss lie on all sides.

Another feature of this range we observe in its conical-shaped peaks, with their remnants of ancient "craters," of which one on the east slope of Mount Elbert, about two thirds up its height, is clearly visible even from Leadville itself. The formation of porphyritic rock we notice as filling of veins in the gneiss rock of this range in the vicinity of the frequent hot springs, occurring farther south in this range.

Now, let us imagine all this region, at the time of the Laurentian period, as a vast plain at the bottom of the sea, and those different strata of gneiss, schist, and limestone formed. Then let us proceed to the time when, gradually and slowly, this country began to ascend from the waters, the line of greatest upheaval passing through the present sites of Mount Elbert and Homestake Peak; the rest of the land, as it ascended, sloping down to the east and west from this line. Let this gradual elevation go on, until the eastern slope and its strata acquired their present pitch of about 12° to 15°. Then substitute for this slow and gradual elevation more violent eruptive action, upheaving the granitic backbone of the Sawatch Range, rending the overlying Laurentian rocks, and pouring out the vast masses of trachytic porphyry overlying the limestone. The proof and the witnesses of this violent volcanic action we see in the old craters of this range; and the way of forming these porphyry masses we see to-day in the action of the hot mineral waters of this range on the gneiss.

Whether all this vast mass of porphyry flowed from these craters alone, or from long fissures parallel to the line of greatest upheaval, we shall leave to imagination as immaterial. We have, any way, in these craters the proof of mighty eruptive forces at work at one time.

Let us pass over this period of active eruptive forces, and come to the time when this flow of porphyritic masses ceased, when the eruptive force was spent, or so far diminished that it lost the power to sustain the weight of the masses of this upheaved region.

We may easily imagine—without introducing this image as a once really existing fact—vast caverns formed by the outpouring of these immense masses of porphyry over the surrounding country. We can easily imagine the caverns largest and deepest nearest to the line of this outpouring, and gradually diminishing as we go east, farther away from this line. We can easily imagine the break-down of the roof of this cavern, by the contraction of the rock by cooling, and we may easily conceive the deepest settling of these rocks nearest to the line of the outpouring. But we may just as easily perceive, without the aid of the image of these caverns, that the greatest reactions, the greatest sinking of the rocks, must have taken place at or near the line of the greatest preceding upheaval, and the diminishing of this settling of the strata as we recede from this line to the east. We should then have, as the result of this period of reaction, a series of breaks or faults running about parallel with the line of greatest upheaval in a northerly and southerly direction, the part on the west side, nearest to the line of greatest upheaval, being always the lower, the deeper-sunken one.

Now these faults really exist. We have these four known, and possibly some at present unknown, benches of limestone overlain by porphyry on the Mosquito Range, succeeding each other in higher elevation as we proceed to the east, preserving the same lithological character and even nearly the same pitch, probably obtained before the breaking up of these limestone and porphyry beds, originally the same, into their present different divisions or benches.

LEADVILLE, January 25, 1879.

EXPORTS FROM GREAT BRITAIN.—The exports of rails from Great Britain during January amounted to 20,473 tons, as against 31,832 tons during the same month of 1878. The exports of all kinds of iron and steel were in the same month in 1879 and 1878, 128,318 and 144,004 tons.

COMING TO NATURE.

The following very clever verses were read at the dinner of the American Institute of Mining Engineers, at Baltimore, on the evening of February 21st, by Mr. A. L. Holley. We take our "copy" from our esteemed contemporary, the *Iron Age*:

A METALLURGIST'S ODE TO SPRING.

Hail, coming Spring! the metallurgist's boon,
Relaxing mines and streams closed all too soon
By cold unchemic, which alike defeats
Reactions, fusions, malleable heats.

Refractory winter to the solving sun
Yields its cold gangue while fluid offerings run,
And nature's furnace, scaffolded within,
By coming spring is once again blown in.

Now draws the pump upon the river shore,
Now o'er the wheel the new-freed waters pour;
The frost shall burst hydraulic pipes no more,
Nor Pat slow pick the ice-bound piles of ore.

No more shall piston-heads on water pound
From steam condensed in pipes meandering round;
The supple belt shall to the pulley bend,
The oil-cup to the shaft its unguent send.

The furnace charged with coal and ore *sans* snow,
The gas producer and the "cupalo;"
These now their functions normal shall perform,
As summer zephyrs keep their bottoms warm.

Thus while the sun these chiefest blessings sends,
It spares some heat to secondary ends;
The seed-time to the husbandman it grants,
His sisters and his cousins and his aunts.

The bursting buds of nature's gasogéne,
Her sand-bath and the sprouting seeds within,
Th' exuding slag from maple saccharine,
The "spiegel" concentrating in the vine,

The flowers resplendent to the visual sense
As all the spectra of the elements,
And their reactions all, by spring begun,
Shall be wash-heated by the August sun.

The verdant foliage in a blooming train,
Where the Spring sun doth roll his beams again,
O'erspreads the fields wet down by tempering rain
From clouds hydraulic lifted from the main.

Anon the direct process nature takes,
And o'er and o'er her spongy products makes;
Her open-hearth with blasts reverberates,
And casts in mineral molds her various shapes.

And now the cock doth sound his liquid lay;
The bull-dog seize the ox-hide in his play;
The bear within his silex cell shall dig,
And in the puddle roll the sow and pig.

So genial spring doth all things put in gear;
Eccentric there, with fly-wheel action here.
Producers thrive, the merchant rolls in wealth;
And here's a ladle to our miners' health.

AMERICAN INSTITUTE OF MINING ENGINEERS—CLOSING MEETING

On Thursday, Feb. 20th, John S. Alexander, M.E., Chairman of the Museum Committee, read the report of that committee, an abstract of which we give below. A resolution was unanimously adopted, approving the report, and tendering the thanks of the Institute to the committee for their arduous services in connection with the arrangement and management of the collection.

Prof. Egleston then moved that the nominations of five members of the Institute, from whom one shall be selected to act in connection with the Pennsylvania Museum, be made by the council, which was adopted. Professor Persifor Frazer, of the Pennsylvania State Geological Survey, then made some remarks on the age of the formation carrying copper in the South Mountains, Pennsylvania, and which he believed to be Mesozoic (new red sandstone) and Huronian, a view in which Dr. T. Sterry Hunt coincided. The paper attracted much interest, as Mr. J. F. Polandy, of Philadelphia, had read a paper on the same subject, when Prof. Frazer was not present, in which he stated that he had found that the rocks were very similar, if not identical, with those of the Lake Superior copper districts, and perhaps in the same geological horizon. Dr. Hunt stated that he had found the rocks at the base of the Huronian copper-bearing everywhere he had examined them.

Charles A. Ashburner, of Philadelphia, of the Pennsylvania State Geological Survey, read a paper on "The Bradford Oil District, McKean County, Pennsylvania," giving the geological characteristics of the oil-bearing rocks of that district, character of the oil, production and depth of wells, illustrated with a series of borings from a well 1719 feet deep, and a map of that district. He stated that the production per day had increased from 100 barrels per day, in December, 1874, when the whole State yielded 27,682 barrels daily, to 23,700 barrels per day in December, 1878, when the whole State yielded 42,538 barrels daily, the present production being four sevenths that of the entire State. Oswald G. Heinrich, M.E., of Drifton, Pa., then read a paper on the "Ammonia-Soda Process," stating that where caustic soda alone is desired it is simpler and more economical than Leblanc's process, now so generally used; it is also more direct. During the past summer, he had seen the process in operation in Belgium, France, near Manheim, Germany, in Hungary, Austria, and at Norwich, England, from solution of common salt by the addition of carbonate of ammonia, forming carbonate of soda and chloride of ammonia. After separating the former from the latter, it can be rendered caustic in the usual way. The amount now imported is valued at $3,500,000 per annum, which can be manufactured much more cheaply here, either on the sea-coast or at the salines in Syracuse, Oswego, and points in the interior.

Frank Firmstone, of Easton, Pa., read a paper by Ellis Clark, Jr., on

"The Great Blast at the Limestone Quarry, at Glendon," by which 50,000 tons of limestone rock were blasted down at a cost of $4000, which has reduced the cost of quarrying and delivering the limestone at the furnaces from 50 cents, including a royalty of 10 cents, to from 43 to 45 cents per ton.

Professor Raymond read some extracts from a paper by Ellsworth Daggett, of Salt Lake City, Utah, on "An Improved System of Cornish Pit Work." Papers were also presented on the following subjects: "An Improved Universal Suspended Hydraulic Lift," by J. A. Herrick, Nashua, N. H.; "Furnace Assay of Platinum Alloys," by Nelson W. Perry, Cincinnati, Ohio; "Determination of Silicon in Pig-Iron," by Dr. Brown; "Sullivan (Maine) Silver Discoveries," by C. W. Kempton; "Index of American Geological Reports," by Prof. F. W. Prime; and a "Review of the Methods of Determining Phosphorus," by Mr. Polake, of Easton.

ABSTRACT OF REPORT OF MUSEUM COMMITTEE.

To the President and Members of the American Institute of Mining Engineers:

GENTLEMEN: Your Museum Committee beg to report that since their appointment in October, 1876, frequent statements of progress have been made to the effect that immediately upon the close of the Centennial Exhibition measures were adopted for packing and preserving the different donations and gathering them into the east wing of Memorial Hall, Fairmount Park, Philadelphia, generously placed at their disposal by the Pennsylvania Museum and School of Industrial Art for one year, without expense for care and janitorial services, which tenure was subsequently extended, pending negotiations for permanent installation; and that on July 1st, 1877, two large saloons in which were arranged the larger and more showy objects of the collection were thrown open to the public; and further, that funds were collected amounting to $2149.77.

At this point the funds became exhausted, and the work of installation was suspended until some permanent arrangement for space and care could be made. The Smithsonian Institution and the Metropolitan Museum of Art, New York, offered accommodations for the collection, the latter accompanying their offer with a proposal to handsomely install the collection in their new building without expense to the Institute. However, the Pennsylvania Museum and School of Industrial Art have submitted a proposition to assume the perpetual care of the collection, embracing the following points:

1st. The necessary show-cases to be furnished by the Museum.

2d. The labeling and cataloguing to be under the supervision of the Institute, and a member of the Institute to be appointed on the Committee of the Museum having charge of the collection.

3d. The name of the Institute to appear on the labels and catalogues, and in the rooms containing the collection.

4th. Members of the Institute to have the same privileges, as to free admission at all times and to all parts of the building, as are enjoyed by the members of the Museum.

5th. The whole management, control, and exhibition of the collection to be in the hands of the Museum.

6th. The collection not to be insured by the Museum, but to be accorded the same care and protection given their own objects in the Museum building.

7th. The Institute to at all times be ready to coöperate to increase the collection and further its usefulness. Your committee, by virtue of the authority given at the Armenia meeting of the Institute, in October, 1877, accepted the offer and passed a resolution requesting that, in consideration of the liberal proposition of the Metropolitan Museum of Art, the Pennsylvania Museum, etc., furnish the former society such duplicate specimens as can be spared without impairing the completeness of collection exhibited by the latter.

Arrangements have already been made by the Pennsylvania Museum, etc., to relieve the dutiable material in the collection from customs surveillance.

Members able to contribute interesting specimens are requested to assist in making worthy of the Institute the collection of Claiborne (Ala.) shells and Silurian fossils from the State of New York, now being formed for the German government.

Abstract of Cash—		Expenditures—	
Receipts	$2,149.77	Installation	$941.65
Expenditures—		Incidentals	11.80
Packing and moving to Memorial Hall	607.90	Fees of Custom-House broker	21.50
Office expenses, including printing and postage	267.59	Balance on hand	14.45
Salary of Superintendent of Installation and Clerk	284.88		$2,149.77

It should be added that $1000 has been pledged by a number of Philadelphia members and others, to further install the collection under the arrangement made with the Pennsylvania Museum, etc.

Your Committee thus return the trust committed to them two and one half years ago, and request that they be discharged.

Respectfully submitted,
JOHN S. ALEXANDER,
Chairman.

February 19, 1879.

SILVER CLIFF, COLORADO.

EDITOR ENGINEERING AND MINING JOURNAL:

I made a better study of Silver Cliff last week than ever before. The workings are now deeper and more frequent. My earlier impression about the country rock being altered sand-rock was incorrect. The rock is "laminated trachytic tufa," and as such should be known. At the contact between this rock and micaceous gneiss—found at the Johnny Bull mine—good galena ores are found. And it seems to me that this character of ore may be found in perhaps good quantities below this trachytic wash. If so, Silver Cliff will have a good reputation—not that its reputation is bad now. The chloride ores from the surface, without sorting, are running 40 to 50 ounces at the Pennsylvania Works, and several tons of ore mined and sampled by Scheyer, Dillinghams & Co.'s mill at Silver Cliff ran 840 ounces on Saturday last. These figures are *correct*. I am afraid the facts of the existence of hot springs can not be proven, although theory cries for them.

R. NELSON CLARK.

ROSITA, COLO., Feb. 18, 1879.

FAILURE OF THE PERU IRON AND STEEL CO.—The failure of this company, of 91 Reade street, is announced. The company owns 20,000 acres of land in Clintonville, N. Y., several iron and plumbago mines, and forty dwellings, mills, etc., nominally valued at $1,000,000. The corporation was organized in 1865, with a capital of $200,000; the officers paid $450,000 for the land, and spent $200,000 more for improvements; dividends were paid until foury ears ago; but since that time the general depression and lack of working capital have embarassed the company. The total liabilities are about $200,000, of which $142,500 is bonded indebtedness. The assets of the company are sufficient to pay this, and leave a margin for the stockholders. The company employed from 400 to 500 men in the mines.

SECONDARY TECHNICAL EDUCATION.*

By Eckley B. Coxe.

Technical education is a subject to which both the American Institute of Mining Engineers and the American Society of Civil Engineers have of late years given much attention, and deservedly so. We all remember the admirable address of our former President, Mr. Holley, at the Washington meeting upon this subject, and the very interesting reunion of the two societies in Philadelphia for its discussion, that was the result of the reading of that paper. The problem to the solution of which the meeting devoted its attention was, "Shall the practical education of the engineer in the mine, in the rolling-mill, in the workshop, or in the field precede, be contemporaneous with, or follow his theoretical studies in the technical school?" I do not propose to add any thing to what was so admirably said by so many of our leading engineers on that occasion; but I shall ask your attention to another question in technical education, which seems to me equally worthy of our consideration, and which, I am sorry to say, has as yet attracted but little attention in this country. It is, "Shall the apprentices (I call them so for the want of a better general name) who are growing up and learning their trades in and around our mines and works, and from whose ranks the master mechanics and foremen of the future must be taken—shall they not be provided with some means of obtaining as much theoretical training as may be necessary to enable them properly to understand the various processes and operations that they may be called upon to superintend, and not be obliged to pick up, as best they may, here a little and there a little truth mingled with much error?" In the former case, those who have the ability and industry to avail themselves of the advantages that should be offered to them would fit themselves to become real foremen, men who would understand and appreciate the true engineer and his methods. Of late years, the young men of this country who have wished to enter our profession have had great facilities offered to them for so doing; there have been undoubtedly great improvements in the methods of instruction; and although I am very far from imagiuing that no further progress can be made, or is demanded, yet I feel sure that those who in the future will be called upon to fill our places will be fully competent to do it. But nothing has as yet been done toward providing any means for what I call "*secondary technical education*." In this, as in so many other things relating to education, Germany leads the van. Her schools for mining engineers *are* already more than a hundred years old, and enjoy a world-wide reputation, and for more than half a century she has had her "*Steigerschulen*," schools for master miners. In almost every important mineral district, the "*Steigerschule*" is a part of the regular administration of the mines, and in them those of the boys employed about the works, who desire to improve themselves, are instructed in all the branches of science which the practical experience of half a century has proved to be the most important for making good foremen. Similar schools exist in that country for the machinist and other trades. Some of those whom I see around me no doubt recall with pleasure the instruction they obtained from the very intelligent Steigers, graduates of such schools, with whom they came in contact when making their practical course of study, or when visiting the mines in Germany.

Promotion is as in the army here, those who stand highest receive the best vacant positions, and all the foremen are taken from the graduates of the school, rising gradually from the less to the more important offices. The advantage to the engineer of having under him foremen who can make a drawing, and, therefore, can read and work from one; who know the chemical and physical properties of fire-damp, and consequently the reasons for the rules and regulations which must be enforced in a mine where it is known to exist; who understand the principles of combustion, and, therefore, why a furnace of one construction is better than another, and why the directions given for firing or using them are essential, is patent to every one who has been obliged to erect or carry on works with foremen who, though intelligent and willing, were entirely ignorant of the principles involved in the operations they were superintending. The United States is entering upon a new epoch in her mining and and metallurgical history. We have almost ceased to draw upon foreign countries for all the more important metals, with the exception of tin, of which as yet no workable deposits are known within our borders; but in iron (including steel), gold, silver, mercury, copper, lead, zinc, and nickel we have become practically independent of the world; some we already ship to foreign countries, and of most of them we shall probably become exporters before many years have rolled round. In other words, gentlemen, we must now prepare to meet the nations of Europe in the markets of the world with the products of our mines, our furnaces, our rolling-mills, and our factories, fully determined to obtain a firm foothold there for the sale of our surplus commodities; not hoping to monopolize them, but simply to secure and retain an independent position. We have many advantages—a country of great resources, cheap land, cheap coal, cheap raw material, cheap food, intelligent workmen, plenty of room for development, and in many respects a good government, well suited to foster such industries; but we should not be satisfied with this. We should endeavor to strengthen our position by educating as well as possible the engineers who are to place and superintend our works, by training both theoretically and practically the foremen who, coming from the ranks of the workmen, will act as a link between the school-trained engineer and the latter, understanding, as they will do, the feelings, the ideas, the aspirations, the strong points, and the weaknesses of those by whom the actual labor must be performed, and who form the basis of successful industry. With good engineers, with such foremen instructed sufficiently in theory to understand and carry out any process they may be put in charge of, having the respect not only of those over them, but also of the men under them, looking forward to their gradual advancement as their years of service and experience increase, and with intelligent workmen such as our country already has and will continue to produce, we can, by carefully utilizing all of our natural advantages, establish *mining* in its widest sense, in that in which it is understood by our institute, as one of the surest, most enduring, and most important elements of the prosperity of our country.

To some, indeed, it may at first appear that the experiment is a danger-

* The opening address at the Baltimore meeting of the Institute of Mining Engineers.

ous one ; that we are treading upon unknown and treacherous ground ; that we may be sowing the seed of future trouble ; that, instead of good foremen, we may only make discontented workmen; and they may quote to us Pope's well-known lines :

> " A little learning is a dangerous thing ;
> Drink deep, or taste not of the Pierian spring."

But, gentlemen, while regarding Pope as a great poet and, in many respects, a keen observer of human nature, I must take issue with him here ; for to me it seems that true knowledge, however small the amount may be, can never be dangerous. It were better, if we can not drink deep, to put but one drop to our parched lips, rather than never to taste of its waters. It is *false* learning, be the amount great or little, that, mingling with the truth and corrupting the latter,causes the danger ; and it is for the purpose of preventing the workmen from imbibing false ideas and opinions, so many of which they now drink in when acquiring practical knowledge, that I advocate the introduction of these schools. Educate the people, educate your foremen, educate your engineers, strive to give to every one some drops, however few, of the water of true knowledge, and we need not be anxious as to their effects, if they are pure, and contain no germs of corruption. The future, not only of our industries, but of our country itself, depends upon this ; for no republic whose corner-stone is not the education of the masses can long continue to hold its place among the nations of the world, or even exist. And further, we may well inquire what, in engineering, is "*a little learning*"? Who of those that, like myself, commenced the study of the profession more than twenty years ago, and can recall the great changes that have taken place in the iron and steel industries, the improvement in the steam-engine, the creation and development of the petroleum industries, the complete uprooting of many of the laws of chemistry and physics as taught us, the changes in the views of geologists, the new methods of studying mineralogy and geology, opened up by the microscope, and the thousand other changes of greater or less importance in science—who of these, I say, looking forward to the development that will be sure to occur in the next twenty years, will dare to assert that he has more than "a little learning" in his own special branch, and that he has drunk deep of the Pierian spring? It is not the imparting of true knowledge to the workman that makes him unruly and discontented ; it is by cutting him off from obtaining it, and forcing him to appease that thirst for knowledge, which exists in so many men, by listening to the uncontradicted assertion of the so-called working-men's friends, political demagogues, and other charlatans who suck the life-blood of the laboring class, living upon their savings without doing any real work themselves, that we sow the seeds whose fruits are seen in strikes and lockouts, and the riots, burnings of factories, and violence which so often accompany them.

The great industrial nations of the continent of Europe are already in motion in the right direction. In all parts of Germany where mining is carried on to any extent, the *Steigerschulen* are to be found. France has her *Ecole des Mineurs* in the department of the Gard. Austria also has hers ; and England, if she desires to maintain her industrial supremacy, must profit by their example.

This is a subject well worthy of the attention not only of the directors, managers, and stockholders of our railroads, machine-shops, mines, furnaces, and other industrial enterprises, but also of all who have any stake in the future of the country, or who are interested in the real welfare of the working classes. As man and boy, I have passed some portions of almost every one of the last forty years in the anthracite coal-fields of Pennsylvania. I have seen the production of that valuable fuel increased from less than one million to over twenty millions of tons per annum, and for the last fourteen years the greater part of my time has been spent in direct contact with the working miners. Looking back upon the coal regions as I first remember them, with the houses (if they deserved to be called by that name) without cellars, without plaster, with scarcely any privacy, with chimneys of wood, and with the outhouses, the pig-sties, the kitchen, and living-rooms so huddled together that it was hard to tell where one began and the other ended ; with nothing for the miners to do but to work all day underground and to pass their evenings in such houses ; with nothing to look forward to for their children ; and with whisky-drinking as the only pleasure which was attainable, I can not wonder that such seed should have brought forth such terrible fruit as the Mollie Maguire trials in Pennsylvania exposed to a horrified community. All parts of the civilized world are now more or less disturbed by the reports of the proceedings of the communists, the socialists, the nihilists, the internationals, the trades-unions, and the numberless other clubs, societies, or associations which periodically appear, particularly in times of depression, and which occasionally startle the world when the attempted assassinations of kings and emperors are or are supposed to be brought about by their influence. Germany is trying to repress them by severe laws, rigorously enforced without mercy to any one ; but the disease, it seems to me, is merely put out of sight, not cured ; the poison is driven inward, some day to break out in an unlooked-for place and when least expected. But it may be asked, what has all this to do with secondary technical education?—for if Germany, with her well-established schools of the kind advocated in this paper, is more disturbed than any other country by the socialists, why should we wish to introduce them here? It must be remembered that in Germany the support of the army requires such a large part of the actual amount of wealth produced by each laborer, that hardly enough is left for the support of himself and his family, and that in many cases it is a desperate struggle for the barest necessaries of life. When such is the state of affairs, it is not difficult to understand the dissatisfaction that exists among the poor there. The great point to be gained by the establishment of such schools, I would answer, is not so much the building up around us of a set of foremen thoroughly trained, both theoretically and practically, familiar with the details of their business, with a strong *esprit de corps*, with a feeling of pride in the works where they have been educated, and with an interest in them that no salary or wages that they might be paid could alone give them. This is a great thing for the owners of the works and for their business success ; but there is a point of much greater importance. Brains, though rare, are not distributed by any known rule among the people. A Stephenson may be born in the cottage of a common miner, and rise to teach the world the profession of engineering. A Franklin may force his way from a printer's case to the position of a great statesman and a great physicist. There are but few men of ability born each year ; but they are as likely to be found in the humblest dwelling as in the palace.

One of the most important problems for a country is, how it can best utilize its most valuable raw material, so as to get the greatest possible effect from it. In the case of men of brains, the answer is very simple. Give them a chance to get an education by which their mental faculties can be afforded an opportunity of being used to advantage ; make them capable of filling with credit to themselves the positions for which their natural abilities fit them. The same men that, under the old system would have risen to the rank of master mechanic, will come to the front under the new ; but they will come more quickly, and better prepared for the positions they may be called upon to fill. The greatest danger of nihilism, socialism, communism, call it as you may, comes from two classes—first, the very ignorant, and secondly, from men of brains, who, finding themselves tied down so that there seems to be no outlet open to them from their present distasteful position, strive to overthrow every thing, in the hope that in doing this they may be able to break away from the place to which they are bound, and to reach some more congenial position. If the boys about a mine, instead of spending their leisure time in taverns, or even worse places of resort, listening to the harangues of demagogues upon the wrongs of the working-men, should utilize it in such a school as I have been describing, they would be likely to feel that they have an interest in the prosperity of the country and in the stability of the government, and that there was a future open to them worth working for. The older men, influenced more or less by the aspirations and opinions of their children, would be likely to sympathize with them. When passing through the coal or iron districts of our country, I have come upon groups of children whose appearance showed every evidence of neglect and want, and there Dickens's well-known lines, "There is not one of these poor creatures but sows a harvest that mankind must reap," have been brought forcibly to my mind. Common-schools for the many, and technical education for those possessing intellectual ability enough to profit by it, although not sufficient alone to cure the evil, will do much toward it, and it is this view of the question of secondary technical education that I would ask the members of our institute to bring to the attention of those to whose care the various industrial interests of the United States are intrusted ; to explain to them the importance of such schools in training up foremen, in inducing good men who are anxious for the welfare of their children to come to and remain at places where they can have such advantages. In converting the more intelligent of the young men about the works into efficient lieutenants in the management of the business, instead of allowing them to become dangerous, or at least troublesome agitators, in addition, a class of employés will be created who, while springing from the working-classes, familiar with their mode of thought, their aspirations and desires, will have had enough theoretical training to comprehend the value of scientific education, its methods and its aims, will be able to understand and talk with the engineer and the manager, to explain to them better than the men themselves could what the employés' wishes or demands may be, and at the same time be more competent to bring home to the laborer the necessity of the changes which are proposed by the employer, or to show to the employer the reasons why he should yield to the demands of the men. The most difficult point in managing men is to find out when we are wrong and ought to yield.

The existence of such a class of men would do much to wipe out the jealousy which exists almost everywhere between the practical foreman and the educated engineer ; for the former would be able thoroughly to appreciate the advantages which the higher education of the latter gives him in solving the different problems which so often arise in all engineering enterprises.

So impressed have we been by the great importance of this question, that it has been determined to establish a school of this kind at our collieries, the plan of which I shall sketch briefly. It is not intended, nor is it to be desired, that it should take the place of the ordinary public schools, or that any thing should be taught in it that can be learned in the latter. We have five good public schools at the works, and our object will be to induce parents to allow their children to remain there as long as they can, or, at least, to profit by the instruction given, and to discourage them from putting the boys to work picking slate too soon, for the sake of the small amount they can thus earn. If they could satisfy their conscience, or turn aside the reproaches of their neighbors by saying that they would send their sons to the apprentice-school at night, many a poor little fellow would be deprived of years of schooling, which he otherwise might get. The school is intended for those of the boys—the sons of our workmen—who have gone to work either with the miners, carpenters, blacksmiths, machinists, plumbers, masons, engineers, pumpmen, etc., about the breakers, or in the mines, with a view of learning their trades and beginning to earn their own livelihood. The course of study will certainly extend over two, and probably three years ; this can only be determined by our success the second year. Any of the boys who have finished their studies at the public schools, or who are sufficiently instructed to begin with the others, and who express a desire to enter, will be admitted. There will be very little discipline of any kind, and every boy who strives to get on, even though he may not have great ability, will be encouraged and aided ; those who show no inclination to work, or who are disorderly, will be dropped. The studies will be so arranged that each boy will always be able to work part time, and so gain practical experience and wholly or partially support himself.

The absence of demand for coal, the insufficiency of the supply of cars, accidents at the mines and on the railroad, and other causes, often force us to suspend work for one or more days. These will always be utilized for study and practical work, such as drawing and mine surveying. We do not wish to do much night work, although a reading room and library will be opened every evening for the students who wish to avail themselves of it. The average boy can not work all day and study all the evening. To properly arrange the time for study and for work will be one of the most important and difficult of the problems with which we shall have to deal. It is important to give the boys all the instruction possible in the limited time and with the limited facilities at our disposal. But at

the same time we must not expect too much of them or risk overtasking them. We firmly believe that "All work and no play will make Jack a dull boy."

The programme of the studies, as far as we have been able to arrange it, comprehends instruction in algebra, geometry, trigonometry, free-hand and mechanical drawing, with descriptive geometry, physics, chemistry, mineralogy, and geology, mechanics and the construction of machines, framing, mining, and mine surveying, English composition, bookkeeping, and writing. Our idea is to make the courses as practical as possible, and to devote particular attention to those subjects which are of special interest in our district. We shall have no course on metallurgy, for example. In mineralogy, we shall require the student to become familiar with the principal types of minerals only. In geology, much attention will be paid to the rocks and mineral deposits of Pennsylvania. We shall devote a comparatively large amount of time to the subject of framing, ordinary foundations, and the construction of such buildings as are required in our coal-fields. In machinery, particular attention will be paid to pumps, hoisting-engines, apparatus for preparing coal, steam-drills, etc. Mine surveying will be gone into with a good deal of detail, and in chemistry we shall try to impress upon the minds of the pupils those laws and phenomena which are of importance in understanding the ventilation of mines and the use of water in steam-boilers. In other words, we do not propose to make good chemists, or mineralogists, or geologists, but to endeavor to impart to the students as much knowledge, carefully selected from each branch of science, as will seem to us, upon mature reflection, to be most worthy of their attention during the limited number of hours that the boys can pass in the school.

Instruction will be given to the students every year by some competent physician upon the subject of the proper treatment, while the surgeon is being sent for, of those who may have been injured in or about the mines; particular attention being paid to those kinds of accidents, such as explosions, falls of slate, and burns, which are most likely to occur in such places.

The plan is far from being perfect, we know; but in a few days the first class will be organized and work will begin. As we progress, we shall undoubtedly have to modify much; but next year, when the second class is formed, we shall be better able to arrange its studies. It is undoubtedly an experiment, one that may not be thoroughly understood by those whom it is intended to benefit; but that it is well worth trying we are certain; and if we do not allow the first difficulties we meet to dishearten us, but push on, slowly perhaps at first, but still without faltering or turning back, success will, we feel convinced, crown our efforts at last.

The establishment of such schools is of great importance to the country; and if those of us who are in a position to aid in the matter would give what assistance we can, and thus bring about the so-much-to-be-desired result, those who will fill our places when we are gone will, I am sure, have reason to thank us for having smoothed their path and removed many obstacles from it. We do not want an institution that a mechanic who has saved money and can pay the board and other expenses of the pupil, can afford to send his son to, but a simple school open alike to the sons of spendthrifts, of drunkards, or of good mechanics, where a boy working every day to gain his livelihood can obtain enough knowledge to make him a better man and mechanic than he otherwise would have been. To do this, we need only, for a beginning, a couple of rooms, a few books, a little apparatus, a determination to succeed, the good-will and hearty coöperation of all about the works, and a resolution on the part of each true engineer to contribute his mite to the accomplishment of the great work.

THE IRON TRADE IN THE LEHIGH DISTRICT.

By E. Canfield.

The object of the article in the ENGINEERING AND MINING JOURNAL of February 1st was to show the most tangible part of the cost of iron for reduction, by putting before manufacturers items of excessive expense that can be reached promptly, and to demonstrate such advantages of location as would warrant a restoration of that lost credit, which "Pig-Iron," in the JOURNAL of February 15th, claims to be a chief cause of the present low price of iron.

The loss of credit is the result of the low price of iron, not the cause.

The depression in trade is caused by a reduction in value of iron, without a corresponding reduction in the cost of producing it.

The true basis of credit for furnace companies is to make their iron for less than the selling price.

The feasibility of making consumers pay two or three dollars per ton more for iron than it is now bringing, by simply demanding it, is fully illustrated in the experience of the coal combination, which had the advantage of control of mines and railroads in the hands of a few parties. A special cause of the low price of iron was the accumulation of 40,000 tons in the yard of the Allentown Iron Company, it being held for higher prices, and finally sold at a great sacrifice.

The question of reduction in price depends on the competition of other districts, particularly the Hudson River District, which has done more in the last three years to reduce prices than all other regions combined; being able to do this on account of the low rates for coal on tide shipments, and their iron, when made, being marketed with very little freight.

The cheaper iron can be made on the Lehigh, the better able will that district be to compete in the general market.

The saving of $1.50 per ton in freight represents, on a production of 12,000 tons per annum for each furnace, an income of $18,000; such a furnace would be worth $100,000, and there is no doubt that abundant capital can be procured for a trade earning 18 per cent. There is no question of the bad management of some furnace companies; but the locality is not to be charged with this; on the contrary, managers are in fault for not availing themselves of the advantages of their situation.

There seems to be a great deal of lethargy among the furnace-owners in developing the greatest possible economy of manufacture. This is due to the enormous profits, formerly realized, having so demoralized the trade that owners think if they can not make 40 or 50 per cent profit, the business is good for nothing. A little more good feeling and union of action among the different companies would greatly benefit the trade, in reducing cost of raw material and regulating the iron market so as to prevent unusual sacrifices by companies in need of cash. This could be accomplished by an iron exchange at New York, with a system similar to the Scotch warrants at Glasgow.

The freights on raw material are higher than they were twenty-five years ago, when there were not one half the facilities for transportation that now exist. The railroads are charging high rates on local trade to pay losses on through traffic.

A few items, in addition to the former article, may be of some use, showing details of cost of iron per ton at Allentown, supposing the furnace company to mine hematite ore and limestone, and purchase magnetic ore and coal.

COST OF PRODUCTION PER TON OF RAW MATERIAL.

	Labor.	Gen'l Expense.	Mine rent.	Freight.	Profit.	Total.
Coal	$0.50	$0.50	$0.50	$1.00	$0.20	$2.70
Hematite ore	1.00	.50	.40	.60	....	2.50
Magnetic ore	1.00	1.00	1.00	1.25	.65	4.90
Limestone	.40	....	....	.10	....	.50

Labor includes all underground miners and laborers for sinking, drifting, and stoping.

General expense includes superintendents, clerks, engineers, surface labor, timber, and supplies.

Freight includes all transportation from mine to furnace by wagon, railroad, or canal.

Limestone is separated in the following table, as it is not affected in the same way as the other items.

COST OF RAW MATERIAL PER TON OF IRON.

	Tons.	Cwt.	Labor.	General expense.	Mine rent.	Freight.	Profit.	Total.
Coal	1	12	$0.80	$0.80	$0.80	$1.60	$0.32	$4.32
Hematite	1	10	1.50	75	60	90	....	3.75
Magnetic	..	14	70	70	70	88	45	3.43
			$3.00	$2.25	$2.10	$3.38	$0.77	$11.50
Limestone	1	00	40	....	....	10	....	50
Total raw material								$12.00

Percentages—Labor	$3.00	.2500	
General expense	2.25	.1875	
Mine rent	2.10	.1750	
Freight	3.38	.28166	
Mine profit	.77	.06417	
Limestone	.50	.04167	
	$12.00	1.00000	
Furnace Labor	1.25		
" Repairs	.75		
" General expense	1.00		
Total	$15.00		

—showing expense at furnace to be ⅛ cost of iron.

The following items are profits: Mine rents, $2.10; excessive freights, $1.50; mine, $0.77 = $4.37, leaving $10.63 as actual first cost of the iron.

If the furnace companies own the mines, the iron should not cost over $12 per ton, with present rates of labor and freight. The Lehigh District suffers because the profits do not go to the iron-makers but to mine-owners and railroad companies. Reduction in freight and mine rents is their only hope for a profitable business. Cheap iron and coal are the basis of prosperity to any commercial country.

February 18, 1879.

THE ORIGIN OF METALLURGY—THE BRONZE AGE.*

(*Continued from page* 128.)

The men of the stone age consecrated natural grottoes for burial purposes, while they also made use of caves as dwellings. Thus on the Meuse, the small cave of Frontal was used as a cemetery for the men who dwelt in the cave of the Mitons. This mode of living was still in vogue at the appearance of bronze. This is proved by the "Grotte des Morts," near Sauve (Gard). As long ago as 1795, d'Hombre Firmas had called the attention of geologists to this cave, but it was examined only in 1869. M. Tessier died during the first clearing out, which was afterward accomplished in the name of the Scientific Society of Alais by Messrs. Cazalis de Fondouce and Ollier de Marichard. The cave is a sort of vertical well, dug out by nature in a crevice of inferior lias. From this there have been dug a large number of bones of men, foxes, wolves, wild boars, horses, sheep, a complete funeral accouterment, composed of arms and tools of silex, bom or deer's horn; a quantity of jet jewelry or of black or green marble, spar and alabaster, an awl of bronze, and many iron beads, many of which were left behind with the rubbish. We will also mention among the natural caves of the first bronze period those of Labry and Banière (Jard), which have brought to light objects similar to those already found, besides a poniard, ear-rings and bracelets of bronze; and the caves of Gonfaron and Chateau Double (Var). That of Saint Jean d'Alcas (Aveyron), discovered in 1838, was explored in 1865 by M. Gazalio. It is partly artificial. At the entrance there had been placed two large arched stones supporting the roof and forming a triangular entrance. One, unfortunately, had been taken away by the owner of the cave, and used as a door-step to his kiln. Among the numerous objects thrown out with the dirt by the same person, there have been picked, mingled with bones and silex, two hatchets of polished stone, beads, a spiral and bronze ring.

The artificial sepulchral grottoes have received the name of covered alleys (*allées couvertes*). They are especially found in Provence, dug out of the small calcareous masonry-works which appear as islets in the fertile plains of Arles. They consist of an oval gallery open above; the walls are inclined toward each other, the top being covered with large flat stones which must, in the first place, have been covered with earth. One of them, the Grotto of Cordes, which is also called the grotto of fairies, was in turn supposed to be a Gallo-Roman cave, a Saracen prison, a Druidic monument, and, lastly, a sepulchral grotto of Asiatic or Phœnician origin. "You first of all descend," said M. Cazalis, "on large round stairs into an ante-court, uncovered at present, which is in the shape of a sword; from thence you proceed, through a gallery six meters long, into the cave proper. At the mouth it is 3·80 meters wide, but narrows in the rear;

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the walls are sloping. This trench, which is twenty-four meters long, is covered by inclined stones, and the whole covered by a tumulus which is much worn. The total length is not less than 54 meters." Unfortunately, the funeral outfits of this cave were scattered, so that the epoch can not be determined, except by its resemblance to the Grotto of Castelet in the neighborhood. The latter contained sixty centimeters (2·6634 inches) of earth and gravel, brought, to all appearances, from Gardon. On this lay the bones of about ten men, together with instruments of silex and bronze, and a saucer of pottery made by hand.

For a long time, *dolmens* were looked upon as Druidic altars, a vague term, which with the words "Celtic" and "Gallo-Roman," is indiscriminately used. Since they have been found not only in Western Europe, but throughout the whole continent, in Africa, and in Asia, new theories have been current. Some scientists have looked upon them as spontaneous transformations from caves; others thought they recognized, from their distribution over the old continent, the migrations of a wandering tribe, which, driven from Central Asia, must have followed the Baltic, stopping at Scandinavia, and would then, driven from the Northern countries, England and Ireland, arrive in Gaul, thence proceeding to Portugal, and finally to Africa. We do not suppose that dolmens have as yet been subjects of sufficient observation in Africa and throughout Asia, nor even in the different parts of Europe, to enable any theory to be substantiated.

The monuments which have received the appellation of megalithic nearly all belong to the period of polished stone; still a large number date from the appearance of bronze. Those of the north are generally the oldest; and if we may judge of their relative dates by the quantity and quality of bronze which has been obtained, their antiquity diminishes in proportion as you descend from North to South. This does not prove, however, that dolmens originated with a race descended from the Northern countries; it would, on the contrary, indicate that bronze brought from the Mediterranean countries reached the North only by slow degrees. There are 147 dolmens in the South of France in which bronze has been found; they are mostly situated in the region of Cevennes, a short distance from the Mediterranean. Several dolmens from Marne and the environs of Neufchatel have also yielded some. Those of Bretagne, with the exception of a few in which a little metal was found, belong to the neolithic period. The 147 dolmens in which bronze was found mingled with objects of stone, pottery of the second period, and other objects which will be mentioned further on, form but a small portion of the great number which have been explored. In the South of France alone, 700 have been opened in Ardèche, 300 in Aveyron, 160 in Lozere. It may be taken for granted, that if all belong to the period of polished stone, the people who built them witnessed the arrival, in small quantities perhaps, of the first common metal. If they had had it in abundance, they would in all probability have made arms, instruments, and even ornaments of bronze instead of stone, shell, horn, or bone; for with a siliceous saw they could accomplish in one day of hard labor what with a bronze saw they could do in an hour, with an iron saw in a few minutes, and in a few seconds with a steel saw impelled by mechanical force. Let us suppose it at present the custom to bury with a person the objects he has used during his lifetime, and that in five or six thousand years our graves should be opened, many circular saws would be found in England, France, Switzerland, Germany; but few in Italy, especially toward the South, still fewer in Spain, one or two in Greece, and not one perhaps throughout European and Asiatic Turkey. We do not, however, notice any migrations in our midst; the industries themselves are propagated, but the people do not migrate; a few men passing from one country to another suffice to introduce new industries. The composition of dolmens is uniform, only that bronze increases from North to South. It seems, then, that there existed in the Mediterranean regions, or beyond, a country from which bronze was brought and distributed through the northwest of Europe.

We must now speak, from the numerous facts collected and classed by M. Chantre, of the beds of bronze which were hidden under ground, and brought to light by mere chance. They are of two kinds, the *foundries* and the *trésors*, to which may be added certain stations or centers of habitation as yet not well classified, and a number of tombs in open fields, whose presence there is nothing to indicate. A foundry consists ordinarily of a mere cavity dug out of the earth, and contains more or less complete the materials of a bronze-founder; ingots of metal, refuse and waste metal, ashes, fragments of things of little value, or worn out or defective, and, finally, crucibles, molds, pincers, and sometimes even new objects coming out of the molds and incomplete. Many such foundries have been discovered in parts of Europe, especially in France, Savoy, and Germany. Should the place and statistics of each be desired, I would refer the reader to the book above cited. The foundry of Larnaud may serve as a specimen. I have already stated how the son of Brenot, the farmer, discovered it in 1865, and how, when offered by his father to a brazier of Lons-le-Saulnier, it was saved by M. Zephirin Robert. After having been exhibited during the Exposition of 1867, in a store on the Boulevard des Filles du Calvaire, it was bought for the Museum of Saint-Germain. The case in which it is exhibited has been classified and labeled by M. Chantre, who, in his work, gives a catalogue and full description. The value of the collection obtained from Larnaud consists in this, that all the pieces which compose it are contemporaneous; there are 1485 such pieces, and the epoch to which they belong is evidently the end of the bronze age. This is what is shown by a comparison with those of the other foundries, and especially with the objects obtained from the *palafittes* of Savoy. Throughout, the last epoch of bronze is characterized by traces of the hammer, by the presence of metallic plates or leaves obtained by concussion and not merely by casting. On the other hand, that which links the workshop of Larnaud with the age when bronze was the only common metal are the cold-chisels made of hard bronze to cut bronze, as steel cuts iron. But since bronze is softer than iron, can it be doubted that cold-chisels would have been made of iron, if the latter metal had been known or was at least abundant? We shall give further proofs showing more clearly the epoch to which we must refer the foundry of Larnaud.

There are other foundries belonging to this period, among which we will mention that of Poype, situated on the heights overlooking the Rhone to the south of Vienna. A portion of the bronze had been sold to a merchant of Lyons, at the price of old brass. It was bought by M. Chantre, who, on precise indications, renewed the search and was able to duplicate the products. The foundry of Goncelin is also situated on the heights adjoining the Isère, as well as those of Thoduse and Bressieuse. The largest portion of the other stations of this kind are in the neighborhood of rivers, and probably at a short distance from the places then inhabited. What is probably the most remarkable is their uniformity throughout Europe. They indicate, to all appearances, the passage or stay, long or short, of workmen belonging to the same class, but who were not natives. Foundries are, in fact, always found in isolated spots, but no traces of human habitations are seen. It is true that habitations may disappear, wooden houses crumble into dust, and the very stones become, in the course of time, dispersed and used elsewhere. There is, at any rate, one product of human industry which never disappears, and attests the presence of man during the most ancient times; that is the baked clay and especially broken pottery. Its tenacity is such that, on closely comparing the soil with some of the fragments, it is often easy to determine the place and size of cities which disappeared several centuries ago. The neolithic foundries are never surrounded by such ruins.

There are but few lacustrine habitations where the metals were wrought, but here the natives might have been taught by travelers. The initiation seems, in fact, probable, from the existence of certain inhabited spots, which are called *stations*. Those which are known are not very extensive; in most cases they are on a line with rivers, as may be seen, for example, on the banks of the Saone between Chalons and Tournus; still there are some isolated ones. The most important of them all is that of Saint-Pierre-en-Chastre in the forest of Compiègne. It is situated on the calcareous plateau in the swampy plains of Vieux-Moulin. It was dug by M. Viollet-le-Duc in 1860, and yielded, among other things, more than five hundred bronzes, which are indistinctly attributed to Gaelic armies. Since then, science having made some progress, they have found that it is necessary to distinguish the objects of stone, bronze, or iron obtained in that locality; that all was anterior to the time of Cæsar; that there were few arms; that the quality of bronze was identical with that of the other layers of that age throughout Europe. On close examination, comparisons showed that the station of Saint-Pierre had probably existed for several centuries, and that it had witnessed, if not the first appearance of bronze in that country, at least the epoch of that metal, and the beginning of the iron age.

But the interest in the stations is, in part, lost in that of the *trésors*, as these seem to demonstrate the reality of the traveling founders; the idea merely being suggested by the foundries. The most important were found in the Alps on the neck of the mountains, some near Moulins and Gannat, two in Meusth, and one near Sarrelouis; there are altogether twenty nine in France, comprising upward of 1350 pieces.

These treasures are composed of new objects, never having been used; sometimes several are joined together, having been cast in the same mold..

They are found in small cavities expressly dug, where they seem to have been hidden for a short time by their possessors. These treasures, those of the Alps at least, are often found on high ground, not far from roads frequented by travelers going from one country to another. There are no signs of a foundry in the vicinity, or even of a station; the spots where they were found are deserts. Is there any thing to be found in these temporary deposits besides objects of traffic? Were they not hidden by the same men who, in the valleys, recast the inferior products of their own industry? If all this leads us to believe that such is the origin of the treasures, there would only have to be determined the direction in which these workmen went to know whether they came from Italy to France, or *vice versâ*. It will directly be seen that this difficult problem is no longer insoluble to-day.

The treasure of Reallon, which is now in the Museum of Saint-Germain, was found in that village not far from Embrun 3880 meters high. "This road, anciently frequented by foot travelers, leads from Saint-Bonnet to Embrun, by Gociere." The treasure of Beauvièars was found by a farmer. This village of the arrondissement of Die is situated on an ancient passage of the mountains, on the peak of Calre, on the road to Luc. There were many other valuables which had been stowed away on the upper banks of rivers, as well on the plains.

(TO BE CONTINUED).

JAPANESE RESEARCHES.—Fragmentary information is from time to time received of the archæological researches of Prof. Edward S. Morse in Japan. They point to the existence there, at a remote period, of a race that preceded the Ainos, who came from Kamtchatka, and were themselves afterward displaced by the present race of Japanese from the south. This inference is based on discoveries of pottery in shell heaps, and of human bones broken so as to obtain the marrow; indicating on the one hand an art, and on the other a vice, neither of which is attributed to the Ainos. Professor Morse is now very busy upon a fully illustrated description of these relics, and is bringing to bear upon them his acknowledged accuracy and skill as a draftsman. He has also in hand new material of value, obtained in a recent trip to Yeso.

THE JAMES RIVER AND KANAWHA CANAL.—The Virginia State Senate, on February 21st, passed the House bill providing for the sale of the James River and Kanawha Canal to the Richmond & Allegheny Railroad Company. The bill goes back to the House for concurrence in several Senate amendments. The price to be paid is $2,000,000 for public works that cost originally from $17,000,000 to $18,000,000, another proof that canals have had their day. The new plan for uniting the James River with the waters of the Ohio is to do it by railway, and the canal, by this sale, passes into the possession of the Richmond & Allegheny Railroad, which will traverse the valley of the James River and give the Chesapeake & Ohio Railroad an outlet to the sea-board without crossing the mountains. The purchase includes vast wharfs and docks at Richmond, the wharfs being 4000 feet long, extensive water-power and a graded series of levels 250 miles long, which can be readily converted into a railway. The new line will bring the West Virginia coal fields into easy connection with tide-water on the James River, and it is expected to be completed in two years. A deposit of $500,000 in United States bonds is to be made by the company in the Virginia Treasury as a guarantee that it will fulfill its obligations.

PROGRESS IN SCIENCE AND THE ARTS.

General Science.

Gas vs. Electricity.—In the first issue of the *Monthly Journal of Science*, the new edition of the old *Quarterly*, which has just come to hand, we find an abstract of a paper by Mr. W. H. Preece, on Gas *vs.* Electricity, in which the author takes practically the same views of the subject that we have expressed in these columns. He observes, that we know no more about the electric light now than we did in 1862, the year of the London Exhibition, when as great a display of electric-lighting apparatus was made as at the Paris Exposition of last year. Recent experiments, he holds, have shown both the strength and the weakness of the gas companies. Their strength consists in their having possession of the ground; and their weakness, in the poor quality of the light they furnish, as compared with electricity. This last statement, however, he qualifies by adding that "from the experiments that have been made, it would almost seem that the quantity of light to be produced by gas is only a question of the quantity of gas consumed in a given space. There are now burning in the Waterloo Road," he adds, "two brilliant gas-lamps, giving a light of 500 candles, and this is greater, in point of fact, than the intensity of the light developed by any one of the electric lights that are now on trial in the thoroughfares of London." In respect to the practical results attained by the trial of the two systems for the detailed lighting of streets, Mr. Preece's conclusions confirm those of M. Cernesson, which are generally confirmatory of the opinion advanced in this department some weeks ago. Mr. Preece, however, recognizes the existence of one serious defect with coal-gas, namely, the color of its light, which, in point of whiteness and purity, is vastly inferior to that of the electric light. This defect, however, may be almost perfectly remedied by the employment of means by which the temperature of the flame is considerably increased, and by other means. How perfectly this may be accomplished, those of our readers who have ever witnessed the results of the Du Mothay and other systems, by which all enriched coal-gas is burned with oxygen in place of common air, need not be reminded. How far the element of cost may vitiate the utility of such processes, we are not now prepared to say. It is singular, however, that in all the discussions of this subject, and the experimental trials to demonstrate the relative merits of the rival lights, no effort should have been made to increase the purity of gas-light, and that no notice has been taken of, and no allusion made to, experiments in this direction which, four or five years ago, attracted wide-spread attention.

Further Researches on the Compressibility of Gases are communicated to the French Academy by M. Cailletet, who makes the announcement that nitrogen does not exactly follow Mariotte's law. He announces, from his observations, that this gas is at first more compressible than the law would indicate, and that then its compressibility diminishes, as he observed to be the case with atmospheric air. The gas presents this maximum at a pressure of 70 meters of mercury.

A New Method of Determining Vapor Densities for substances which vaporize above 440° has been suggested by Herr Victor Meyer, in a paper read before the German Chemical Society of Berlin. Without entering into a detailed description of the apparatus he employs, and which would hardly be understood without an illustration, we may state that the principle upon which he proceeds is the measurement of the air displaced by the vapor of the substance. It is unnecessary, by this procedure, to know either the volume of the vessel or the temperature of the bath employed, concerning which it should be remarked that the operation is carried out by placing the apparatus in a bath of some liquid that can be heated to the temperature required to volatilize the substance under examination. The results obtained, according to the author, are sufficiently accurate for most chemical researches, and the method recommends itself for the ease and expedition with which the determinations may be made.

The British Institution of Mechanical Engineers, in the absence of government aid to this important branch of science, has decided, we learn from the London *Engineer*, to appropriate a considerable annual sum from the funds of the society for the purpose of promoting practical research in mechanical subjects. The scheme proposed contemplates the appointment of a research committee, which shall be charged with the selection of a list of subjects upon which further research is deemed desirable, which list is to be submitted to the council of the society for approval. Sub-committees will then be selected to take charge of each of the subjects selected. The research committee, in their choice of members of these sub-committees, propose to invite any gentlemen specially familiar with particular subjects to assist the members. The duties of the sub-committees, comprising the collection of all existing data on the subject in hand, the determination of new experiments and lines of research, and the mode of making and of giving publicity to their results, are fully described, and the whole scheme appears to be very admirably devised. The institution has decided to expend in research during the present year the sum of £300.

The Intimacy of the Relation between Population Density and Death Rate, though long recognized in a general way by sanitary authorities, has been very pointedly brought out by Dr. Farr, F.R.S., who announces, as a law that holds good for 619 districts of England and Wales, which he has carefully compared, the general dictum, that the rate of mortality increases as the density of population increases.

A Modification of the Germ Theory of infectious diseases, which is today almost universally accepted as the only one which can satisfactorily account for their origin and dissemination, has been proposed by Von Naegeli, a noted German investigator. He admits the validity of the germ theory so far as to agree with the generally-accepted view that the so-called infectious diseases are caused by the activity of the lowest organisms; but holds, contrary to the general view, that only such germs are dangerous or able to cause infection, as are taken into the system, by means of the organs of respiration, with the air we breathe. He considers, therefore, infection, through the unbroken skin, or through the stomach or other digestive organs, from food or drink, to be impossible, and urges many facts showing that such organisms are taken into the system with impunity with many kinds of food and drink, in substantiation of his views. Von Naegeli's views appear to us to be so flatly and decidedly contradicted by an abundance of facts which prove conclusively that water, milk, etc., are among the most dangerous carriers and spreaders of disease, that it is scarcely worth while to discuss them.

Geology, Mineralogy, and Metallurgy.

Progress in Steel Making.—*Van Nostrand's Magazine* of current issue contains a description of the Thomas process of producing steel from highly phosphoretic pig-iron, from the performance of which it would appear that the presence of this element will not be considered in the near future the bugbear that it has been in the past. It has heretofore been held that two tenths of one per cent of phosphorus in pig-iron was an insuperable obstacle to its conversion into ingot steel; and though this general belief has received some modifications of late, in view of the fact established by the Terre Noire Company that as much as 0·32 per cent of phosphorus could be tolerated in very mild steel, it has still been maintained by steel-makers that no removal of the phosphorus could be hoped for in any direct steel process. This last position must now, according to our authority, be abandoned in view of the demonstration, at the Blaenavon Iron Works, that there are means by which phosphorus can be removed with certainty and economy, and that intensity of temperature is no obstacle to its removal. This demonstration, it is asserted, has been confirmed by the results obtained in Belgium with the Ponsard furnace, lined with one of the Blaenavon basic preparations. The highly basic condition of the slag, which is one of the essential elements of success in the operation of this process (Thomas's patent) was effected by the addition of lime and a certain amount of ore. An analysis of the steel obtained showed that 90 per cent of the phosphorus contained in the pig had been eliminated; and an analysis of samples, taken at intervals during the operation, indicated a progressive decrease of phosphorus in the bath and its transference to the slag. These results have been obtained so uniformly that, we are told, it is now contemplated to regularly work the Ponsard converter in combination with the new basic process, on the highly phosphoretic pig of Belgium and Germany, by which it is expected to effect a considerable economy over the use of Bessemer pig.

A Discovery of Graphite is reported to have been made in Wellington Province, New Zealand, to which much importance is attached. The deposits are reported to be very extensive, and to be excellent in quality. Samples that have been analyzed at the Colonial Laboratory are stated by *Colonies and India* to have proved equal to the best Cumberland lead.

Numeite is the name applied to certain selected specimens of the mineral garnierite (the remarkable nickel ore of New Caledonia, which has attained of late such importance as a valuable source of that metal), which from their beauty are now employed for various ornamental and artistic uses, like the finest specimens of malachite and lapis lazuli. It is said to make very handsome stones for brooches, ear and finger-rings, etc., which are popular and at present much sought after in Paris, where they were first brought out at the Exhibition by the well-known house of Christofle & Cie.

Chemistry, Physics, and Technology.

Apropos of the Production of Artificial Gems, the ruby and sapphire, by MM. Fremy and Feil, an account of whose highly ingenious methods and remarkable results appeared in a recent issue of the JOURNAL, we are called upon to notice certain suggestive experiments made by the late M. Gaunal, having for their object the production of the diamond by artificial means. We glean from the *Popular Science Monthly* the fact that among the papers of the deceased *savant* was found one which purported to have been presented, years ago, as a memoir to the French Academy, describing the following procedure: Phosphorus is allowed to act upon liquid carbon disulphide (both as pure as possible). A decomposition of the liquid slowly ensues, the sulphur uniting with the phosphorus, and the carbon separating itself in the form of dodecahedral diamonds of the size of a millet seed. The purity of these crystals, it is stated, was proved, by the strictest tests, by M. Gaunal and others. The experiment was repeated many times by M. Gaunal, and always with the same results. The artificial diamonds had apparently the same hardness as the natural stone. The process is described to be very slow, as much as six months being required before crystals of the size above named made their appearance.

These results, though of no immediate practical value, are, nevertheless, highly interesting in a scientific sense, and will, doubtless, especially in view of the brilliant results obtained by Fremy and Feil, stimulate others to solve the glittering problem of producing the diamond of sizes sufficiently large to possess commercial value—a result which we do not regard as altogether improbable of solution.

Hemacite is the trade name given to a product obtained by mixing certain comminuted vegetable or animal substances (such as sawdust, bone or ivory dust, etc.) with bullock's blood, reducing the same to a dry powder, and then subjecting the substance, in suitable molds, to the combined action of heat and pressure. The resulting product, which may be obtained in a great variety of useful and ornamental forms, and variously colored, possesses great strength, excellent finish, and sharpness of outline. For certain uses the inventor employs sections of paper, cloth, or leather in place of the ingredients named above, and by the judicious selection of colored powders, it is easy to understand how a variety of pretty effects may be obtained. It is designed as a substitute for hard rubber and the composition used for a host of miscellaneous articles. Among the most notable objects made of hemacite, ornamental door-knobs may be specially named. The French have long had a species of monopoly of this class of manufactures, the products known as *bois durci* and *eburine*, made of similar materials, but doubtless by an essentially different process, having, for some years, been extensively manufactured. As a very ingenious mode of utilizing practically waste materials, the new manufacture is worthy of much commendation.

Chlorozone is the name given by the *Teinturier Pratique* to a new bleaching agent designed as a convenient and advantageous substitute for chloride of lime, eau de Javelle, or Labarraque's liquor in the art of bleaching. Its cost is said not to exceed that of chloride of lime, as at present used, and it is claimed to possess a number of advantages over

this agent, chief among which may be named greater rapidity of action, saving of the acids required to intensify the action of the present bleaching bath, avoidance of direct contact of the goods with lime, and the utilization of the residues, which, with the chloride of lime, are without value. The composition of this new agent is rather vaguely stated to be "oxygen combined with chlorine, and with a base which may be soda or potash."

Two new methods for the estimation of minute quantities of carbon, and their application to water analysis, have been described before the Chemical Society of London by Dupré and Hake. Their mode of procedure, which we condense from *Nature*, is as follows: The first consists in burning the substance in a current of oxygen in a combustion-tube with oxide of copper, absorbing the carbonic acid in a Pettenkofer tube with baryta water, filtering off the barium carbonate with great care, converting it into chloride, then into sulphate, and weighing; while in the second procedure, the carbonic acid passes into a 2 per cent solution of basic acetate of lead, and the turbidity produced is compared with that produced by a solution of carbon of known strength in a Mills calorimeter.

The peculiarly dangerous nature of the occupation of fork-grinding has lately been pointed out by a distinguished English physician. The operation of grinding is done dry, and the workmen are constantly breathing an atmosphere charged with the cutting dust dislodged from the metal and from the stones, a species of exposure that slowly but surely undermines the strongest constitution, originating disease of the lungs, causing difficulty of breathing, and coughing, which symptoms begin distinctly to manifest themselves at the early age of 25. Our authority finds that the average duration of life of workmen in this trade does not exceed 30 years.

A Galvanometer, which measures the strength of the electric current directly, instead of indirectly, as in the instruments commonly employed, has been constructed by Prof. Dolbear, of Tufts College. He utilizes the force exerted by a common helix to draw the core within itself when a current is passed through it, which is directly proportional to the strength of the current. A simple mechanism, consisting of a spiral spring, a graduated scale, and a pointer, suffices to measure the strength of the current.

Engineering, Mechanics, and Miscellaneous.

The Isthmian Canal.—Among the news of the past week, we may notice the item that Lieut. Wyse, of the French navy, whose name has frequently appeared in these columns in connection with the proposed inter-oceanic canal across the American Isthmus, is at the present time in Washington, on special business connected with this much-discussed project. It has transpired that M. de Lesseps has requested the various commercial nations to send delegates to Paris, for a meeting appointed on the 15th of May next, to decide upon the best route for a canal, and Lieut. Wyse is said to be here to explain the plans of de Lesseps, who is desirous of seeing the United States well represented at the proposed international congress.

A Railway Connection, to which important consequences may attach, was, according to the local papers, made a few days ago by the laying of a switch in the vicinity of Lehigh avenue, Philadelphia, by which the North Pennsylvania and the Philadelphia & Reading railroads were connected; and which, it will be noticed, gives the Philadelphia & New York New Line a through route from New York to the west and southwest, and practically elevates it to the dignity of a through trunk line. The *American Manufacturer*, in referring to the consummation of this important step, gives the following facts in relation to its history: The Baltimore & Ohio Railroad Company, it states, has been seeking for some years for a means of reaching New York without the necessity of running its cars over the line of the Pennsylvania Railroad, a result which has at length been attained by a combination with the Philadelphia, Wilmington & Baltimore, the Philadelphia & Reading, the North Pennsylvania, and the Bound Brook & New Jersey Central railroads. The last link of the connection was formed by the laying of the switch referred to at the opening, connecting the North Pennsylvania with the Richmond Branch of the Reading Railroad, and the first trains passed over the new connected lines on the 15th of February.

Steam Tramways on the Highways are said by the London *Times* to have been very satisfactorily introduced on the public roads in Portugal. The average running speed is about 8 to 10 miles per hour, though in special cases a speed equal to from 20 to 25 miles has been attained. A number of such steam roads are in operation in the district about Lisbon, which are stated to be under perfect control on the steepest gradients, and are worked among the ordinary movements of public road traffic, with remarkable freedom from accident. Road and farm locomotives, again, which are almost unknown in this country, seem to be growing in favor elsewhere. One English firm, says the Chicago *Railway Review*, has built altogether 1600 of such engines. [The celebrated firm of Aveling & Porter is probably here referred to.—ED.] Of these the British government has purchased about 100, and many others have been sold to the Italian, Russian, and Turkish governments.

The St. Gothard Tunnel, on the 26th of January last, had been driven 6421·3 meters on the Goeschenen side, and 5906·9 meters on the Airolo side, leaving 2571·8 meters in the center of the mountain to be pierced.

The Pouyer-Quertier Project for laying two additional Atlantic telegraph cables, one from France to the United States and another from England, has, according to the *Journal of the Telegraph*, been again revived; though, says our authority, it meets with but little encouragement. The question appears to be whether it would not be more prudent, in view of the fact that the cables at present laid and in operation are more than sufficient for the transmission of all business that is or is likely to be offered, to lease one of the existing cables. The *Journal* deprecates the new project in the interest of the existing companies.

A Telegraphic Writing Machine, the invention of Mr. E. A. Cowper, is described in a recent number of *Nature* as a practical and very meritorious device. The writer of the article in question, who affirms that he has seen the apparatus at work, states that its results are quite as startling as those of the telephone. A writer in London, for example, takes up the pen, "and simultaneously at Brighton another pen is moved, as though by a phantom hand, in precisely similar curves and motions." The apparatus, it is stated, is shortly to be brought out at the meeting of the Society of Telegraph Engineers.

The Perforation of Marble by a marine boring animal (the sponge known as *Cliona sulphurea*) is a novel fact observed and noted by Prof. Verrill. The facts in the case are briefly as follows: A vessel laden with Italian marble was wrecked in 1871 off Long Island, and the exposed portions of the slabs which occasionally come to light, are found to be thoroughly penetrated to the depth of an inch or two by the crooked, irregular borings of this sponge, and reduced to a complete honeycomb, readily crumbled between the fingers. Beyond these borings the stone is still perfectly sound and unaltered. Prof. Verrill notices this as the first instance recorded where this sponge has attacked limestone, since calcareous rocks do not occur along the portions of our coast inhabited by it; and he suggests that its demonstrated ability to destroy such rocks so rapidly might have an important practical bearing on the use of limestone structures for submarine works.

Some Fifty New Species of fish have been discovered in our Atlantic waters during the year 1878, by the labors of the U. S. Fish Commission. A full description and classification of these important discoveries will appear in the publications of the U. S. National Museum.

THE MANUFACTURE OF IRON IN COLOMBIA, S. A.—Thomas J. Agnew, of Philadelphia, has the management of constructing, on the plains of Bogota, United States of Colombia, a blast-furnace and foundry. The machinery for the work is already on the spot. The value of an enterprise of this kind can not be overestimated, as it will enable the people of the interior to manufacture heavy pieces of machinery, which it would be almost impossible to transport over the mountains.

NITROUS OXIDE UNDER PRESSURE.—P. Bert finds that by placing a patient in an apparatus where the pressure can be increased to two atmospheres, nitrous oxide can be administered so as to produce continued anæsthesis, while the blood receives its normal supply of oxygen and the normal conditions of respiration are maintained. From various experiments on animals, he thinks that gas administered in this way will be harmless, however much the insensibility may be prolonged.—*Comptes Rendus.*

A GOLD FEVER IN ILLINOIS.—A dispatch, dated Chicago, February 26th, says: "There is considerable excitement over the reported discovery of gold near Marinette, in Menomene County. Ike Stephenson, a prominent citizen of that place, says that out of three specimens of ore taken from the mine one yielded $16 of gold and silver per ton, another $24, and the third $29. There have been 75,000 tons of iron ore shipped from the mine in the past season, which undoubtedly contained much gold and silver."

THE NEW LAMP OF M. DUCRETET.—A description of this lamp is given in our contemporary, *La Nature*, of Jan. 11th: "The particular principle which the lamp presents consists in the employment of a column of mercury in which one or more carbons are placed. The different densities of these substances cause the carbon to rise to the surface. To prevent this action and obtain the light, a carbon of somewhat larger section than the one immersed vertically in the mercury is placed horizontally, so that the end of the vertical carbon impinges against it. The light obtained is, therefore, similar to that of the Harrison, Regnier, or Werdermann light. A battery of from six to ten Bunsen elements has given good effects. One great advantage of this system is, that the resistance of the circuit remains almost constant, that portion of the vertical carbon between the level of the mercury and the horizontal electrode forming what may be termed the real resistance of the circuit. It should be noticed, however, that the resistance is not absolutely constant, inasmuch as the carbon being consumed, the level of the mercury will be slightly lowered, and so the resistance is really increased by a constant quantity.

SAN JUAN (COLORADO) SILVER MINES.

Special Correspondence of the Engineering and Mining Journal.

Without meaning to be in the least irreverent, I feel like addressing the ENGINEERING AND MINING JOURNAL as *Salvator noster qui es* in New York. Now, this is not in response to a delicate hint, contained in one of your late numbers, that you were not "averse to judicious flattery;" for I consider all *flattery* "bad form," and, to quote from the *Tin Trumpet*, "by no means so easy a weapon to wield as people imagine; it is like a flail, which, if not adroitly used, will box your own ears, instead of tickling those of the corn." But *praise* is a horse of quite another color, and in your case thoroughly well merited for the course you are taking with regard to mining and mines as an investment, and no man can feel more truly thankful that there is now a chance of the same being reduced to an honest and legitimate business, than one who has made it his profession, and who works underground eight hours, besides studying and writing on the subject three hours more, out of the twenty-four, in his efforts to make it a success.

To all those interested in mines and mining I say that it is a duty they owe to themselves and the profession, as well as being a good investment, to subscribe for and support the ENGINEERING AND MINING JOURNAL in every possible way, and for the following reason: Every sensible man knows that you are not publishing the paper for fun, for love, or because of an affliction with the *cacoethes scribendi*, but to *make money*, and you have taken your stand boldly on the side of square dealing and fearless exposure of frauds. The sensible man also knows—that is, if ordinarily posted in the "ways that are dark and tricks that are vain" of mining business—that you could probably make money a great deal faster, and more of it, by going over to the enemy: *ergo*, it is our best policy to do all we can morally and pecuniarily to support the paper in the course it has taken.

Long and sadly has the cause of honesty in mining needed such a champion. When I was in London, two years ago, to mention American mines to a friend was to be at once suspected, and the trite saying you were invariably met with by mining firms was, "If the Americans have any thing good, they keep it; if it is worthless, they come here to unload." Unfortunately this perfectly true, as narrated in your own columns quite

lately. I don't know that it makes very much difference to us, as every one in England seems just now to be on "Queer street," and there is money enough and to spare in this country for all our mining needs; but it is a pity it should be so, and unless there is a very radical change in the matter, I hope I may never be reduced to the necessity of endeavoring to obtain capital in England to work any of our mines.

Not that, mark you, they are any more honest over there than in this country; only they have a different way of floating a bubble company. A lord or duke being seduced into being president of the board, and one or two clergymen in the "outfit," does the trick. With such names, it "must be all right," and the ultimate sufferers are widows, spinsters, and clergymen with small incomes, and who are, of course, tempted by the bait of high rates of interest. A man living in the west end of London needn't go east of Temple Bar to find quite as much rascality as in the city of New York. There are scoundrels in every community, and my countrymen are by no means infallible. *Here* there are no lords or dukes, and I doubt very much if the fact of the President of the United States being president of the board of directors would help the scheme one iota, and its success, therefore, rests on its own merits, and the ingenuity of the promoters.

The public may depend upon it that, in nine cases out of ten, failures in mines have not been the fault of the mines, but caused by reckless or incompetent or dishonest management. I believe with your correspondent "K. K.," that the Ontario mine of Utah is the "best mine in the United States to-day," and why? Simply because of an honest and straightforward management. But I also believe there are many better mines that have failed to pay dividends.

San Juan during the past year has made big strides toward development; but taking a "bird's-eye view" of our mines and miners, what do I see? Still a region of "gopher-holes" and prospectors! We have had no "carbonate" or gold excitement to draw capitalists with a rush, and make our riches known in a day. Ours is solid quartz mining, which offers insuperable obstacles to the poor miner, the amateur miner, and the lazy miner—the first can't, the second doesn't know how, and the third won't try. So our growth and attainment of notoriety are slow, but our great veins, which may be seen outcropping on the mountain sides and summits in all directions, are fabulously rich and easy of access, and are one by one, passing from the hands of the prospector into those of the moneyed worker, and, with the present rapid building of railways toward us, and the erection of reduction works and building of toll-roads and trails in our midst, we must soon come to the fore as an immense silver-producing region, and one which will see the come and go of many generations.

To the man, therefore, who wishes to go into mining *as a business*, this region offers many more inducements than older and better developed ones. Rich and promising prospects are cheap and plentiful, and, generally speaking, "every one has a mine and no one a dollar"! To him who has a business in the East, and who only invests in mining as a side-issue, I suppose stocks are more suited, as he then has none of the cares of management.

We have a few magnificent mines here which have been developed, but they paid from the first shot, or this could not have been done by the owners, who were poor men necessarily; for if they had been rich, they would not have been prospectors.

When I have said that the greater proportion of our mines are in the hands of the original discoverers—prospectors—I have at once accounted for want of development. A prospector belongs to the same species as the miner, but is, in fact, a very different kind of bird. Any man of average intelligence and fairly robust frame, and who is fond of roaming over the mountains with grub, tools, and blankets packed on his burro, may come to be a successful prospector and find a rich lode; but when it comes to tunneling in its solid rock—no, thank you!—that is too, too solid work, even though there be pay in sight, and he prefers to do his assessment (provided he can not "sell his stake") and sit down to wait the coming of the man of capital to buy him out. This done, he lights his pipe and travels onward in his search for more. There is a wonderful fascination about it, and I think the genuine prospector rarely gives up his nomadic life, and as rarely, as far as I have seen, gets rich.

I have now been working in the San Juan mines for two years, and I can not call to mind any one man or pair of men, owners of a claim or mine, who have been personally working in the same for one year steadily. There may be such, but I have no knowledge of them, and I know nearly every body. It seems to me that directly a man gets a rich claim, instead of jumping in with a will. with pick and shovel, sledge and drill, he immediately wants to stay down in the "camp" and smoke cigars and wear a "biled shirt." If he can lease it during the winter, that just suits him, and he goes up in the spring to find his mine "gutted," and that it will cost more than he made out of the lease to put it in proper shape. It's no use talking. A man must work all day and every day (Sundays excepted) to make money at mining, just the same as in any other business. The fact is, we have been spoiled here. Rich claims are so plentiful that their real value is not appreciated, and they are looked upon more as a sort of currency or wherewithal to "make a stake," than as a fortune for life if properly worked.

A friend of mine who, two years ago, made a tour of the whole San Juan region, estimated that in a radius of twenty miles there were upward of six thousand claims on which yearly assessment work only was being done. This being the case, is there any silver belt in the United States which offers such inducements for a visit to the man of capital, accompanied by an "honest and competent mining engineer"?

As to miners, we have very few of them, about one in ten—that is, what *I* call a "miner." Most of ours have been, until their arrival here, barbers, carpenters, butchers, bakers, and candlestick makers, lawyers, doctors, clerks, *et hoc genus omne;* but, having learned to drill a hole, put in some powder, and "blow her off," they at once become miners and mineralogists of the most erudite stamp. All black-looking powders or decomposed matter in a vein are "sulphurets." Gahl ores are "brittle silver" or "sulphides," and just now every thing in the shape of red sand is "carbonates," they not having, at the same time, the most remote idea of the actual meaning of any of these terms.

In Europe if a man is destined to become a butcher, baker, carpenter, blacksmith, etc., he has to serve an apprenticeship to that trade; if a clergyman, doctor, lawyer, etc., it takes years of study before he can qualify. But here, in mining, which either as a trade of working miner or profession of engineer of mines, admits of more skill, experience, study, and research than any other known, a man can become a "miner" or "expert" in a few weeks. In the Royal School of Mines, of London, the studies comprise chemistry, physics, mineralogy, applied mechanics, geology, mining, metallurgy, biology, paleontology, and mechanical drawing, and it takes three years' study of these before a man can get his degree of A.R.S.M. Even in the manual of mining, how few seem to realize the amount of skill, judgment, and art that may be displayed in "putting on a bit" and tempering it to a nicety, "pitching a shot," and "moving rock" generally. But, without a knowledge of these arts, all the energy and muscle in the world are useless in tunneling in solid rock. As my partner expresses it, "It's no use to go at rock like a bull at a hay-stack. The rock is the strongest every time." W. W.

OURAY, February, 1879.

GENERAL MINING NEWS.

ARIZONA.

We are indebted to the Yuma *Sentinel* of February 15th for the following extracts:

"One of the owners of the Oro Bonita mill and mine informs us that the new ten-stamp mill is running successfully. The mill is now crushing five tons of ore per day. The ore from this mine is free-milling gold ore, yielding, on an average, $100 per ton. They have about four hundred tons on the dump. The only trouble at present is a lack of water. The *Sentinel* mentions some very rich copper discoveries, about fifteen miles east and south from the old Ajo copper mines, and some sixty or seventy miles southeast from the railroad at Texas Hill. The ledge crops boldly for two and a half or three miles, in many places from 120 to 140 feet wide; this statement is coroborated by several parties who have seen the mine, and who say these croppings are mostly ore. Much of the float is malleable and can be cut with a knife. The ledge was shown to the locators by an Indian, who charged them one dollar for his trouble.

CALIFORNIA.

BODIE DISTRICT.

According to the Bodie *Standard* of February 15th, the expenditures of the different companies of the Bodie District, mostly for wages and supplies, amount to $150,000 to $200,000 per month. During the week there were several developments of an important character. The True Ten mine, on the west slope of Silver Hill, made a strike of a 12-foot ledge of silver ore, which, although of low grade, $18 or $20 rock, is very promising, as it is found but 140 feet from the surface. The Queen Bee has met a well-defined 3-foot ledge of solid quartz on the 250 level, which is of good quality. There is the appearance of a bonanza in the Noonday. The ledge is 3 feet wide, and assays have been made going up to $461.66 per ton. The Tioga has cut into its ledge on the 420-foot level. Eight feet had been penetrated, and the foot-wall was not then reached. Very active developments are going on in the Standard, and the mine is looking very well. Work on the different levels of the Bodie mine is being prosecuted, the usual amount of ore is being extracted, and the bullion production is undiminished. The strike of the engineers, which promised to disturb operations at all of the mines, is now ended.

CANADA.

Gold mining in Marmora is progressing satisfactorily. The Feigel mine is employing about twenty-five men, and making satisfactory profits. The Williams shaft is being sunk, and is now down 135 feet, and the vein is looking better than ever before. The Gatting Company at a late meeting decided upon plans for the furtherance of its operations. The ores in this district are arsenical pyrites, containing from $40 to $60 per ton, and the veins are very large. There are few properties in this country more worthy the attention of capitalists.

COLORADO.

SILVER CLIFF.

All late advices from Silver Cliff mention the greatest excitement there on the discovery of carbonates of lead within a few miles of the town. There seems to be no doubt that a number of important discoveries have been made, and that rich ore abounds, the ground prospected since the first of the month being about six miles in length in the Wet Mountain Valley. Mr. Carl Wulsten, the first discoverer of carbonates, thinks that this camp will hold a position second to Leadville. The average of the Herman crevice will assay forty ounces in silver and thirty per cent of lead, with a tendency to improve. Assays from other discoveries run very high. Ore taken from the Thames claim at a depth of not over ten feet gave 90 ounces of silver as a working result.

LEADVILLE.

This mining camp does not appear to have lost any of its powers of attraction, although it is generally acknowledged that too many mechanics and others have already gone there. A correspondent of the Ouray *Times* says that an Illinois company has purchased lumber and other materials to be used in the construction of smelting works with a capacity of 150 tons of ore per day. The Denver *Tribune* says:

"Mr. G. M. Gerrish, of Leadville, late of the Malta Works, passed through Denver last week on his way to Chicago for machinery to erect immediately the largest smelting works in Leadville."

Also that "Messrs. S. B. Morgan and Adin Alexander have lately returned from Leadville, where they completed the purchase of all other interests in the Wolfstone, Agassiz, and Monte Christo mines; and also associated themselves with Mr. Henry H. Stotesbury, formerly of the firm of Cochran, McLean & Co., of New York."

The Leadville *Eclipse* estimates that the product of the Pittsburg Consolidated Company will be nearly 200 tons per day very shortly, and that the Little Chief will yield 100 tons per day. The same paper says that careful measurements in the Fryer Hill mines indicate that between $75,000,000 and $100,000,000 in ore has been opened for stoping, and that the Iron, Argentine, and Adlaide mines show fully $20,000,000 more. The California experts who lately visited Leadville do not apparently see the same amount of ore in sight. The Deer Lodge mine on Fryer Hill is reported to have struck very rich ore.

The Boulder *News* of February 21st reviews the condition of a number of the Boulder County mines. We glean the following: The Hunt smelter at Orodelfan is running full capacity, and an additional furnace is being constructed. The Delphi Consolidated Company has a pay streak from 4 to 10 inches wide, yielding from $40 to $80 per ton. The first-class ore of the Logan mine runs up in the thousands of dollars per ton; second class, $700, and third class, $120. The Melvina is working 12 men, who are taking 235 tons per month. The shaft is down 360 feet, and will be sunk 430 feet before levels are driven. The December product was between $7000 and $8000. The Wren mine shows 18 to 20 inches of good concentrating ore. The first-class ore of the Logan mine runs up in the thousands of dollars per ton; second class, $700, and third class, $120. The Melvina is working 12 men, who are taking 235 tons per month. The shaft is down 230 feet, and sinking is still in progress. The Baron lode has a pay streak of about six inches, containing very rich telluride ore and free-gold ore, some of which assays $43,000 per ton. The Victoria and Goldsmith's Maid are shipping ore in paying quantities.

DAKOTA.

THE BLACK HILLS.

From the *Pioneer* of February 15th we extract the following :

"*The Potato Gulch Strike.*—The largest specimens of nugget gold ever found in the Black Hills were gotten in Potato Gulch. Upward of $50,000 have been exhumed from the gravel of that narrow ravine, one nugget of which brought $128. Nearly all the gold found was exceedingly coarse, varying in size from that of a hazel-nut to that of an egg. Many lumps were found imbedded in quartz, thus showing that it had been washed out of a decomposed quartz vein, not far from where it was found. It is believed the mother vein has been found. Nine feet of ore have been disclosed, and only one wall rock reached.

"The ore is of a lively reddish color, mixed with white quartz, through which permeate stringers of gold. Some pieces found in the quartz are as large as a robin's egg. The richness of the vein can hardly be approximated.

"Potato Gulch, with the prestige that its rich placers has attained, is destined to be the theater of active operations.

"In the Bobtail District, the old Terra mill is pounding away, and, as a pipe will be run down from the ditch, and the water will soon be coming along in it, little or no further trouble is anticipated on that account.

"The De Smet mill is once more in full blast.

"Pinney's mill has resumed operations after a few days' rest.

"The Mineral Belt tunnel is now in a distance of seventy-eight feet, the leader showing several stringers of good looking-quartz."

The Segregated Old Abe, of Lead City, has suspended work on account of a restraining order, granted on application of the California Company.

The Racine Company is accumulating a large quantity of ore, and expects to soon start again.

Large amounts of high-grade ore are taken out daily by the Anchor Mining Company in the Strawberry Gulch. The Boss Tweed mine, which is located on a contiguous mountain, struck in their 58-foot shaft an immense body of ore, similar in character to that of the Anchor mine, and yielding about $400 to the ton. In the same neighborhood the Rich mine, the Surprise mine, and the Vanderbilt are developing into high-grade ore mines.

Mr. Otto Grantz and others, owners of the Financial mine, are now taking out ore for milling. This mine adjoins the Belcher portion of the De Smet property. A tunnel of 100 feet has been run into the vein and shows a fine body of quartz. This is one of the oldest locations in the district, but has until recently remained unworked.

There are now between 900 and 1 000 stamps continually crushing ore, and over 200 more are in process of erection and will be completed within the next three months.

IDAHO.

The *Silver City Avalanche* of February 15th says :

"The recent thaw has seriously retarded mining operations in this vicinity. The roads leading from the mines to the mills are in bad condition and quartz hauling has been temporarily suspended. Work has been progressing as usual at the Black Jack.

"The force at the Morning Star mine has recently been increased. The vein is from one and a half to three feet in width, with the best quality of rich quartz all through it.

"The mine hitherto known as the Phylox has been merged into the Trook and Jennings.

"Work on the extension of the Florida mine will be vigorously prosecuted. The road to the mine, temporarily obstructed by the recent slides, will be opened next week, and the hauling of ore rock to the Leonard mill will be resumed. There are now thirty tons out ready for crushing. The ledge is six feet wide.

"The Savage mine, which is not far from the county court-house, is looking unusually well. The ledge is heavily streaked with gold.

"The Potosi is looking well. The shaft is down about 180 feet, and the first level drift south is in nearly 90 feet. There are nearly 60 tons of rich ore on the dump awaiting crushing."

MONTANA.

We take the following from the Helena *Independent* of Feb. 15th: "An important discovery has been made on the Black Hawk lode, an extension of the Penobscot. The ore is rich and resembles that found in the Penobscot. Mr. Vestal and Capt. Frue think that it is an extension of the Penobscot. About one hundred men have regular employment at Vestal.

"In the Big Blackfoot District, considerable work is being done and several favorable discoveries are reported.

"In the White Pine lode, which is located near the Willow Creek lode, the first clean-up of 18 tons at the Mallory mill netted $100 per ton.

"Messrs. Means, Connable, Ash, Center, and McCabe have at last struck bedrock in the lower drain on White's gulch, at the depth of 32 feet, after several years' work, and now have two solid miles of mines, every foot of which promises to pay handsomely."

UTAH.

THE BINGHAM DISTRICT.

A correspondent, writing to the *Salt Lake Tribune* under date of February 19th, says: "Until very recently, Bingham, with the exception of a few placer diggings, was supposed to be entirely a lead camp, but later developments prove that she is rapidly drifting into a more profitable and richer investment—gold.

"The Bulldozer is a mine of the same character as the Stewart. A drift of 280 feet has been run entirely in gold-bearing ore, free milling and bearing no lead. At the outset the foot-wall was struck, since which time the drift has been run entirely in ore ; free gold is frequently met with, and the pan produces colors in every wash. As this mine is in close proximity to the Stewart, upon the same hill and the same character of ore, there is no doubt that it will rank as high as any in the cañon.

"A recent strike in Barney Gulch, below the railroad depot, is attracting some attention. It is named the Greenhorn. An incline has been run on the vein about twenty feet and several holes sunk to trace the vein, which has been found to extend over 500 feet. Assays made from various portions of the vein run from $11 to $40, gold, carrying but little silver and no lead.

"The pay-streak so far averages about three feet, and between walls about seven feet.

"The Saturn is turning out some fine galena ore. It is now under lease.

"The Moscow and Centennial are working on ore.

"The Bully Boy has been leased. The outlook for the lessees is good. The ore is of high grade, and by careful manipulation will do well."

THE SILVER REEF DISTRICT.

From the *Miner* of February 15th we condense the following :

"A rich strike is reported to have been made in the Compton mine, adjoining the Duffin mine. The ore was struck in the tunnel at a distance of 150 feet, showing a body of about four feet of ore.

"The sinking on the Stormont mine goes regularly on at the rate of about two feet every 24 hours. The vein of ore is six feet thick, three feet of which is high grade. When an additional depth of 50 feet is attained, stoping will be commenced.

"In the Last Chance bonanza the decrease of ore for the month past was scarcely perceptible, though the latter has been raised from the mine at the rate of about 60 tons per day. It is estimated by competent judges that there is ore enough in sight in the bonanza to run the company's mill for the next twelve months, which has a crushing capacity of 70 tons per day.

"The developments made in the Manhattan shaft are most valuable as throwing light on the ore-belt of this portion of the camp. It would seem to indicate that the ore strata extend immediately under the town of Silver Reef.

"The shipment of bullion from Silver Reef through Wells, Fargo & Co. for the week ending February 15th aggregated $21,932.82.

"The camp is again overrun with men looking for work.

"A new discovery is reported ; it is situated two miles east of Mud Spring, in iron country, and about ten miles northwest from Rush Lake toward Shauntie.

"A number of men from Silver Reef have started for the new camp."

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received :

Monument—Granite and Bronze ; M. Nichols, Chairman Monument Committee, Buffalo, N. Y.	March	1,	1879
Grading Market street, Trenton, N. J. ; Robert S. Johnston, Trenton, N. J.	"	"	"
Gas Illumination of Rio de Janeiro, Brazil ; Salvador de Mendonca, Brazilian Consul-General, 42 Broadway, New York City	"	"	"
Building Reservoir and furnishing 3300 feet of 8-inch Water-Pipe ; W. R. Hart, Secretary State Penitentiary near Huntingdon, Pa	"	"	"
Cleaning and Keeping Clean, for one year from April 1st, all Public Streets and Roadways ; A. Dempster, City Engineer, Pittsburg, Pa.	"	3,	"
Furnishing Two Boilers ; Thomas R. Whitehead, Clerk Board of Education, Cleveland, O	"	"	"
Lighting, Furnishing Material, Repairing, etc., 134 Street Lamps, with other than coal-oil ; John L. Reed, City Clerk, Rock Island, Ill	"	"	"
Lighting, Furnishing Material, Repairing, etc., 116 Naphtha Lamps, for 2 years ; J. G. Tuerk, City Clerk, Davenport, Iowa	"	4,	"
Coal, 50,000 tons ; Lead, American Refined, 125,000 lbs. ; Cast-Iron Service-Pipe, 1,500,000 lbs. ; Iron and Brass Castings, Miscellaneous Supplies, including Stationery, Oils, Hardware, Bricks and Cement, Clocks, Iron and Steel, etc. ; Department for Supplying the City with Water, Wm. H. McFadden, Chief Engineer, Philadelphia, Pa	"	"	"
Architects' Plans for the Construction of a County Hospital ; Board of Supervisors, Sacramento, Cal	"	5,	"
Indian Supplies, including Wagons, Plows, Reaping and Thrashing Machines, Fence Wire, etc. ; E. A. Hayt, Commissioner Department of the Interior, Washington, D. C	"	"	"
Maps and Plats—to construct all necessary Maps and Plats to enable the several District Assessors to correctly reappraise all real estate in 1880 ; B. J. McKinney, County Auditor, Washington County, Marietta, Ohio	"	"	"
Constructing Dams on the Mississippi River between Clarksville, Mo., and Hamburg, Ill. ; F. U. Farquar, Major of Engineers, U.S.A., Rock Island, Ill	"	8	"
Constructing Sewer, distance of about 2450 feet ; City Engineer, Des Moines, Iowa	"	10,	"
Fuel, Forage, and Straw ; Charles H. Tompkins, Department Quartermaster-General, St. Paul, Minn	"	12,	"
Marking and Rating Stamps ; D. M. Key, Postmaster-General, Washington, D. C	"	18,	"
Dredging at Erie Harbor, Pa. ; John M. Wilson, Major of Engineers, Erie, Pa	"	20,	"
Locks and Keys for Mail-Bags ; D. M. Key, Postmaster-General, Washington, D. C	"	"	"
Coal for Schools of Youngstown Board of Education, Youngstown, O	"	29,	"
Books and Blanks for Board of Assessors ; Commissioner of City Works, Brooklyn, N. Y	April	9,	"
Coal for Public Buildings ; Western District Commissioner of City Works, Brooklyn	"	"	"
Coal for Public Buildings ; Eastern District Commissioner of City Works, Brooklyn	"	"	"
Railroad Grading ; P. Bremond, President of the Houston, East & West Texas Railway, Houston, Tex			
Railroad Grading ; 75 miles ; P. Bremond, President of the Houston, East & West Texas Railway, Houston, Tex			
Foreign Contract.—To lay and work up a submarine cable, between Luzon (Philippine Islands) and the coast of China ; Ministerio de Ultramar, Madrid, Spain			

The contract for furnishing Lehigh coal for the Court-House, Philadelphia, was awarded to Charles G. Weaver, at $4.05 per ton for egg and $4.20 per ton for stove.

The Painesville, Youngstown & Pittsburg Company has been chartered to build a road from Youngstown, O., to the Pennsylvania line, in order to form an extension of the Pittsburg, New Castle & Lake Erie narrow-gauge.

Mining Machinery Wanted in China.—The just-published English Consular Report from Canton, China, states that General Fang, a well-known military officer, has been instructed to arrange for an immediate supply of European machinery to be used in local mines.

The contract for the construction of the section of the Thunder Bay branch of the Canada Pacific Railway, 118 miles, from English River to Eagle River, has been awarded to Messrs. Marks, Connors, Genty, Purcell & Ryan, at $2,250,000. The section from Eagle River to Kewatin, a distance of sixty-seven miles, has been awarded to Messrs. Morse, Nicholson & Marpole at $3,500.000.

At a recent meeting of the Camden (N. J.) Common Council the Water Committee reported in favor of paying $500 for drawings and specifications of plans for a new engine-pump at Pavonia, capable of pumping 6,000,000 gallons of water per day. It was stated that the present engine is in a dilapidated condition, and a new engine is needed.

Mr. Dunham, Chief Engineer of the water-works, presented his annual report, representing that the works are in good condition, but the necessity of a new engine was seriously felt. He recommended that the Council take early measures to provide the city with such engine. The Water Department reported having received during the past year the sum of $56,253.89 from all sources.

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from *The Official Gazette of the United States Patent Office*, for the week ending February 4th, 1879 :

No. of Patent.	*Title of Invention.*	*Name of Inventor.*	*Residence.*
211,829	Turbine Water-Wheel	Albert Ball (a)	Claremont, N. H.
211,833	Electric-Signal Fire-Hose	Joseph Buchtel	Portland, Or.
211,846	Apparatus for Assorting and Washing Coal	Roger Hartley (b)	Union, Pa.
211,883	Hoisting-Register	H. C. Behr	Virginia City, Nev
211,891	Lifting-Jack	Alfred S. Dinsmore (c)	Boston, Mass.
211,893	Apparatus for Washing and Amalgamating Ores	Constant Duhem	San Francisco, Cal.
211,905	Coating Sheet-Iron with Zinc or the Alloys of Zinc	Richard Heathfield	Birmingham, Eng.
211,909	Alloys for Metric Gold Coin	William W. Hubbell	Washington, D. C.
211,939	Amalgamator and Settler	Walter S. Shotwell	San Francisco, Cal.
211,953	Apparatus for Casting Metals	Horace W. Barnum	Omaha, Neb.
211,968	Anglometer	John V. Capek	New York, N. Y.
211,975	Micrometer Screw-Gauge	George W. Dickinson	Ashtabula, Ohio.
211,985	Electro-Magnetic Engine	C. J. B. Gaume	Brooklyn, N. Y.
212,037	Motor Engine	E. J. Molera	San Francisco, Cal.
212,040	Regulator for Electric Light	" "	" "
212,051	Ore-Separator	Paschal Plant	Washington, D. C.
212,077	Manufacture of Alloys	N. W. Williams (d)	Philadelphia, Pa.
212,084	Still for Hydrocarbon Oils	Charles M. Gearing (e)	Pittsburg, Pa.
	Re-issue.		
8,567	Manufacture of Illuminating Gas	Alfred P. Southwick (f)	Buffalo, N. Y.

(a) Assignor to the Sullivan Machine Company, same place.
(b) Assignor to James Mullens, Wooster, O., and A. W. Boyd, Allegheny City, Pa.
(c) Assignor of ½ his right to Chas. F. Curwen, Salem, Mass.
(d) Assignor to himself and W. W. Keys, same place.
(e) Assignor of ½ his right to George Nevergold, same place.
(f) Assignor, by mesne assignments, to Edward Stern, New York.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending Feb. 22d and years from January 1st:

TONS OF 2240 LBS.	1879.		1878.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co..	40,298	361,862	53,317	400,885
D. L. & W. RR. Co.	66,349	434,788	28,890	298.797
Penn. Coal Co.....	17,821	136,315	437	87.426
L. V. RR. Co.	20,632	107,445	36,043	132.008
P. & N. Y. RR. Co..	317	4,139	130	1,749
C. RR. of N. J	33,437	182,745	22,928	98,036
	172,854	1,227,294	141,745	1,018.892
Lehigh Region.				
L. V. RR. Co.....	35,400	270,511	80,254	306,499
C. RR. of N. J.....	39,311	234,441	27,682	119,404
S. H. & W. B. RR..	.....	3,390	.....	3,204
	74,711	508,342	107,936	429,107
Schuylkill Region.				
P. & R. RR. Co	104,412	768,365	1,657	316.424
Shamokin & Lykens Val.....	8,597	50,113	.....	49,334
	113,009	818,478	1,657	365.758
Sullivan Region.				
Sul. & Erie RR. Co.	912	8,636	740	5,635
Total	361,486	2,562,750	252,078	1,819,392
Increase.....	109,408	743,086	.....	.....
Decrease	.....	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Belvidere Delaware Railroad Report for week ending Feb. 22d:

	Week.	Year. 1879.	Year. 1878.
Coal for shipment at Coal Port (Trenton)	.....	.....	.....
Coal for shipment at South Amboy	6,718	35,927	97,654
Coal for distribution.....	5,005	43,539	24,479
Coal for Company's use	1,382	12,609	13,549

The increase of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 14,642 tons, as compared with the corresponding period in 1878.

Perth Amboy Business:	Tons.
Received for the week	11,027
Shipped for the week....	10,665
On hand Feb. 22d..	101,762

The Production of Bituminous Coal for the week ending Feb. 22d was as follows:

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb	18,658	115,819
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs	7,955	52,097
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.....	2,144	18,7 2
*East Broad Top.....	1,118	8,130
Clearfield Region, Pa.		
*Snow Shoe...	458	463
*Tyrone and Clearfield....	27,953	154.525
Allegheny Region, Pa.		
*Pennsylvania R. R	3,260	26,499
Pittsburg Region, Pa.		
*West Penn R. R.....	4,743	26,823
*Southwest Penn. R. R.....	701	4,343
* Penn & Westmoreland gas coal, Pa. R. R.....	19,283	94,302
*Pennsylvania R. R.....	8,299	53,773

*For the week ending Feb. 14th.

The Production of Coke for the week ending Feb. 14th:

Tons of 2000 lbs.	Week	Year.
West Penn R. R.....	2,527	12,972
Southwest Penn. R. R.....	18,915	122,963
Penn. & Westmoreland Region, Pa. R. R.	1,236	10,161
Pittsburg, Penn. R. R	3,444	21,648
Penn. R R. (Allegheny Region).....	1,085	7,025
Total	27,007	174,769

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 28, 1879.

Anthracite.

The week under review, by comparison with some of the earlier weeks of this year, has been rather quiet, but still there has been a better business done than is usual at this season of the year. Buyers are all holding off with the expectation of purchasing at the very lowest price that coal may reach, but the probabilities are that they will, as a rule, wait until the market becomes a rising one, and will not purchase in large quantities until they have to pay more than they do now. The present prices of coal are ruinous to the producers and can not be continued for any great length of time. These prices must result in a curtailment of production (in fact, they have already done so), and with the large business that seems clearly indicated upon the opening of inland navigation, an advance in prices must take place. A great revival is in progress in all branches of iron manufacture; the inducements offered by the trunk lines to the shippers of anthracite coal will insure a very largely-increased market, while the comparative severity of the season will exhaust the stocks of domestic coals and furnish a demand unequaled perhaps by any thing in the past.

There does not seem to be any chance of forming a combination, yet it is not improbable that suspensions aggregating four or six weeks may be fixed upon for the year. With the exhaustion of the dead-work and the greatly reduced supply of labor that has taken place during the past three years, suspensions aggregating six weeks would probably reduce the supply to the requirements of the market, provided an effort were not made to charge exorbitant prices for coal, which would, of course, limit the demand.

On Wednesday the usual monthly auction sale of the Delaware, Lackawanna & Western RR Co. took place. There was a very good attendance, and as soon as the bottom to prices was indicated, the bidding became quite spirited; so much so that the quantity of coal sold exceeded by many thousands of tons the quantity announced for sale. The prices received are certainly discouraging, but the indications of the wants of the market were more encouraging than at any sale for a long time past. The following quantities of coal were sold, and average prices received, comparison being made with the prices received at the previous sale:

	Tons.	Average prices, Feb 26.	Average prices, Jan. 29.
Steamer.....	6,000	$2.25	$2.35
Broken.....	25,000	2.27	2.32½
Egg.....	26,000	2.27½	2.32
Stove.....	56,500	2.64½	2.75
Chestnut.....	7,000	2.42¾	2.39½
Average.....	114,500	$2.46¼	$2.50

The average of Wednesday's sale was but 3¼ cents under that of the January sale; but this is the result of the sale of so large a quantity of stove coal, which brought the highest price.

The coal trade suffers still from the efforts of an element seeking to bring about a combination, rather than to secure the best prices for coal. The benefits of combination, according to reports of the companies for 1878, appear to have been entirely with the Wyoming companies; the Philadelphia & Reading RR., the Lehigh Valley RR., the New Jersey Central RR., and the Lehigh Coal and Navigation Companies all showing that their earnings were less last year than in 1877, when there was no combination.

Since the auction sale there has been a general reduction in circular prices for coal. The following are some of the leading quotations:

The Lehigh & Wilkes-Barre Coal Co. quotes as follows f. o. b. at Port Johnston:

	Lump.	Steamer.	Broken.
Honey-Brook Lehigh....	$3.00	....	$2.80
Wilkes-Barre.....	2.40	2.40	2.45
Plymouth Red-Ash...		....	2.45
	Egg.	Stove.	Chestnut.
Honey-Brook Lehigh....	$2.80	$2.80	$2.60
Wilkes-Barre.....	2.45	2.80	2.60
Plymouth Red-Ash.....	2.50	3.10	2.70

The Pennsylvania Coal Co. quotes f. o. b. at Weehawken, as follows:

Steamer	$2.30	Stove.....	$2.65
Grate	2.30	Chestnut	2.35
Egg.....	2.30	Small chestnut....	2.00

These prices, after allowing a commission to dealers or contractors, are lower than the average prices received at the Scranton auction sale.

The Lehigh Valley RR. Co. will reduce tolls on coal to-morrow, when they will be as follows: From Penn Haven to Perth Amboy, $1; from Mauch Chunk, 86c.

A dispatch from Philadelphia yesterday says:

"At a meeting of the Schuylkill coal operators this afternoon it was agreed to adhere firmly to the following prices for the coming month, and the circular for line and city trade will be issued as follows: Broken, $2.90; egg, $2.15; stove, $2.25; chestnut, $2. These rates are for white-ash coal at Schuylkill Haven."

The production of anthracite coal last week was 361,486 tons, as against 380,801 tons the previous week, and 252,078 tons the corresponding week of 1878. The total production from January 1st to February 22d was 2,562,750 tons, as compared with 1,819,392 tons for the like period of last year, showing an increase this year of 743,086 tons.

Bituminous.

There is nothing to note in the trade in this article. There has been no important business done, and as yet there is nothing to show clearly what prices are likely to prevail during the year. It is probable, however, that but little change from 1878 will be shown.

In gas-coal there has been nothing done yet. The probabilities are that the large gas companies will not buy largely early in the year, and thereby establish a price for the balance of the market. It looks as though the business would be of a hand-to-mouth character.

James Macfarlane, Esq., who has for many years represented the Blossburg coal interests in the markets of Western New York, has accepted the agency for the same coal companies for the Western States, Canada, and the tide-water market, which is chiefly at the large rolling mills at Troy, N. Y. There is also under his charge the market for this coal in the New England States. Mr. Macfarlane's business headquarters have been removed from Syracuse to Corning, N. Y. The local market for this coal in the State of New York west of Schenectady, will hereafter be in charge of Mr. James M. Ward, at Syracuse, N. Y., who will represent in that district the McIntyre and Schrader Coal Companies, as well as the three Blossburg companies.

Messrs. Robert C. Adams & Co., of Montreal, have written the St. John's (N. B.) *Telegraph*, as follows:

"It may be of interest to your many readers to learn of the G. T. R. coal contracts for 1879, and the effect the proposed coal duty has upon them. The G. T. R. has just contracted for their year's supply, some 160,000 to 170,000 tons. The prices at all points east and west are lower than last year.

"At Montreal, they take 40,000 tons for consumption there, and at Brockville, from the Albion Mines, Pictou, at a price under $3.50, *ex* ship in Montreal.

"At International Bridge, they take 70,000 tons American coal at $2.69; another coal was offered them at $2.60, but the contract had been closed the day before. At Belleville, they take 10,000 tons, and the same quantity at Detroit, and are offered coal at $3 per ton. All these American contractors run the risk of a duty. The coals are well liked and considered much better than Cape Breton coal. At points in Ohio, good coal is delivered f. o. b. the G. T. R. cars at 60c. per ton. Freights from England are now offered for coal at 4s. per ton."

Pittsburg. Feb. 27, 1879.

COAL.—The condition of affairs at the collieries on the Monongahela remains without change, as it was last week. Only two or three of the mines are being worked. The hands lately employed at all the others are out on a strike, and many of them are interfering with those who are at work and trying to get them out also to train with those who are insisting on an increase of pay to 3 cents a bushel from 2½, for which they are working. The reduction to one half former wages is deemed unreasonable. That this half will go fully as far in the support of a family is lost sight of. The sum seems so much less to the ear that they will not realize the equality in buying what they want—that they are in reality receiving as much substantial value at 2½ cents as they did when they were paid 5 cts. There is not now on hand more than coal enough to make a single towing fleet for the lower river trade. No conveniences are prepared for storing supplies, and no coal is mined for this business, only as it can be at once discharged into the craft in which it is to be transported down the river. The boats thus laden are taken to the places of sale where they remain until their cargoes are disposed of. Owing to this the number of boats is greatly augmented, the stocks in the lower markets awaiting sale being generally held in them. As supplies in Cincinnati, Louisville, Memphis and New Orleans are adequate to the consumption, at least to the first of May, and as there is no fear of the miners standing out much longer, or of there being a lack of water when there is coal ready for shipping, the seeming embarrassments of the trade have not in the least affected prices, so that quotations remain unchanged:

PRICES AT PITTSBURG.

Wholesale, on board.....	4	cts. per bushel,	$1.06 per ton
Retail, delivered	5½	" "	1.46 "

AT CINCINNATI.

Wholesale, on board.....	6	cts. per bushel,	$1.59 per ton
Retail, delivered.....	7½	" "	1.99 "

AT LOUISVILLE.

Wholesale, on board.....	6	cts. per bushel,	$1.59 per ton
Retail, delivered..... ..	7½	" "	1.99 "

AT NEW ORLEANS.

Wholesale, on board.....25	cts. per barrel,	$2.42 per ton	
Retail, delivered.....40	" "	3.87 "	

Bushels are rated among dealers here at 76 lbs.—26½ bushels make a ton, nearly.

The barrel that rules the coal measurement in New Orleans contains 2 4-7 bushels of 80 lbs. each, making about 200 lbs. Nine and two thirds of these barrels weigh a ton, within a small fraction.

COKE—This industry moves onward in a steady, undeviating line, the production being exactly adjusted to meet the demand. This is necessary, as there is no means of storing at the ovens; all is loaded into cars as fast as it is prepared for use. Exact work is needed to accomplish this, the demand must be reliable, as well as the provision for carrying it away. Such a perfect system of connections in a manufacture of 30,000 tons a week is curious indeed. Prices stand as last quoted: $1.15 to $1.20 per ton of 2000 lbs. at the ovens.—*American Manufacturer.*

San Francisco. Feb. 20, 1879.

COAL.—Imports from January 1st to February 1st: Anthracite, 595 tons; Coos Bay, 3310 tons; Vancouver Island, 10,828 tons; Seattle, 9825 tons.

The Nanaimo *Press* thus alludes to the product of the British Columbia mines: "The return of coal shipments published by us a few days ago shows a marked increase on previous years. The shipments for 1878 reached 190,640 tons, as compared with 142,237 tons for 1877, and 140,000 tons for 1876, and 113,000 tons for 1875, and 81,397 tons for 1874. It will thus be seen that the exports of staple product have more than doubled in the four years between 1874 and 1878, and the shipments of 1878 exceed those of 1877 by 48,403 tons. Although there has been this large increase in the export of coal, there has also been a marked decrease in the profits of coal mining, both to the miner who delves in the bowels of the earth, and the parties who furnish the capital necessary to work the different collieries. Naturally one would suppose that, with the increase in ex-

ports, there would be a corresponding increase in the prosperity of the district. Such, however, is not the case, for at the present writing there are a great many men out of employment in this district, and those that are fortunate enough to be regularly employed are not making near as good wages as they did a few years ago. Still, at the same time, if we compare this district with similar districts in the old country and in the neighboring Republic, we have much to be thankful for. The coal market has been greatly depressed, and at the then ruling rates our coal mine owners and managers were selling the coal without any profit; but the market has improved a little, and the prospects are that the exports of 1879 will exceed those of the year that has just passed into history." The market at date is without especial change. The three cargoes of English sold at $8, to arrive from Hull, as noted in our last, seems to be considered a high price, and it is doubtful if the same could now be duplicated. The spot market continues to be well supplied from the British Columbia and Seattle mines. The Wellington is taking fast hold of the household trade of the city. The price of this is $9, and Seattle $8 for screened. We see that dealers offer to sell Coos Bay, delivered to families in any part of the city, at $7.50. This is queer, when we consider that the cargo price of same to dealers is $7 from ship's side. Buyers of this would do well to examine the weight and quality of same. California Mount Diablo Steam sells from boat at $4.50@$5.50 for fine screenings and coarse respectively. It is generally claimed by dealers that the cost of drayage and delivering to families is not less than $2@$3 ₱ ton; hence Wellington, West Hartley, and Scotch Splint sell to families delivered at $12@$13, short ton, all other kinds in proportion. There is no Australian here, and, so far as we know, very few cargoes now afloat *en route*, quotable at $7. Anthracite and Cumberland are both in liberal stock, with a restricted demand; prices both low and nominal. Arrivals during the week include Mary Glover from Seattle, — tons; Empire from Nanaimo, with 400 tons; Gem of the Ocean, 1020 tons Seattle, etc.—*San Francisco Commercial Herald.*

New York.

Wholesale Prices of Anthracite Coal Delivery f. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.	$	$	$	$	$	$
Lackawana, at Weehawken	.....	.....	.....	.....	.....	.....
*Pittston, at Weehawken	.....	2 30	2 30	2 30	2 65	2 35
L. Val. Coal Co., at Amboy	.....	.....	.....	.....	.....	.....
Honey Brook Lehigh	3 00	.....	2 80	2 80	2 80	2 60
Wilkes-Barre at Pt. Johnson	2 40	2 40	2 45	2 45	2 80	2 60
Plymouth Red Ash at Port Johnson	.....	.....	2 45	2 50	3 10	2 70
LEHIGH COAL.						
†Spring Mount, Lehigh, at P. Amboy	3 25	3 00	2 85	2 85	2 85	2 75
Cross Creek, at Port John.	3 00	2 75	2 75	2 75	2 75	2 70
†Buck Mount, Vein at Elizabeth Port or S. A.	3 00	3 00	2 60	2 60	2 85	2 75

[a] Forty cents per ton additional for delivery in New York.

† These prices are given by Whitney, McCreary & Kemmerer.

Wholesale Prices of Bituminous Coal.

MANUFACTURING AND STEAM COALS.

Cumberland at Georgetown and Alexandria	2.75@2.90	4.35@4.50
Cumberland, at Baltimore	2.90@3.00	4.35@4.50
Cl'rfi'd "Eureka" and "Franklin."		
At mines	0.75	....
At Baltimore	3.25	.... 4.50
At Philadelphia	3.25	.... 4.50

DOMESTIC GAS COALS.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside at New York.
Westmoreland and Penn	$4.25	.....
At Greenwich, Philadelphia	.....	$5.50
At S. Amboy	5.00	5 50
Kanawha at Richmond	4.10	5.40
Red Bank Cannel, Pa., at Philadelphia	8.00	8.50
Youghiogheny, Waverly Co., at Balt	4.00	5.65
Despard, West Va	4.50	6 00
Murphy Run, West Va., at Baltimore	3.75	5.85
Fairmount, West Va., " "	3 75	5.70
Newburg Orrel. Md. " "	3.75	6.00
Cannelton Cannel, West Va	....	10.00
" Splint " at Richmond	6.00	7.00
" Gas Coal at Richmond	4.00	5.65
Peytona Cannel, W. Va., at Richmond	....	10.00

Retail Prices.

Per ton of 2000 lbs,
Anthracite.

	G. & Egg.	Stove.	Chest.
Pittston coal delivered	$3.75	$4.00	$3.75
Lack. coal, delivered below 59th St.	3.75	4.00	3.75

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 28, 1879.

American Pig.—The Thomas Iron Company reports sales of about 2000 tons of Nos. 1 and 2 Foundry iron, at $17.50@$18 and $16.50 respectively. Besides this, there have been sales of other brands aggregating from 2000 to 3000 at about the same prices. There is but little inclination to sell ahead, and there is more firmness to prices than we have seen for a long time. There is a very healthy demand, and a much better feeling exists in the trade. We quote No. 1 Foundry at $17@$18; No. 2 Foundry, $16@$16.50, and Forge, $15@$16. No. 2 Foundry iron is in better supply than No. 1.

At a recent meeting of representatives of the Eastern rolling-mills a much better feeling was expressed, it being represented that the demand was very good, and an advance in prices was called for. A committee was appointed to confer with the owners of other mills throughout the country, with the view of establishing a regular and higher schedule of prices.

Scotch Pig.—There is but very little doing in this class of iron. 100 tons of Glengarnock were sold to arrive. Eglinton and Coltness have sold in a small way at our quotations. We quote Eglinton at $20; Glengarnock, $20.50@$21, and Coltness $22.

Messrs. John E. Swan & Brothers, of Glasgow, under date of Feb. 14th, say the number of furnaces in blast was 88 against 87 a year ago. The shipments to Feb. 8th showed an increase of 3920 tons over those to same date in 1878. The imports of Middlesbrough iron in the same comparison showed a falling off of 6367 tons. There was in stock in Connal & Co.'s stores 210,348 tons of iron, an increase of 2376 tons for the week. The quotations for No. 1 iron were as follows: Coltness, 50s.; Langloan, 50s.; Gartsherrie, 47s.; Summerlee, 47s. 6d.; Carnbroe, 44s.; Glengarnock, 46s., and Eglinton, 42s. 3d. Middlesbrough iron, f. o. b., Tees, was quoted as follows: No. 1, 37s.; No. 2, 35s. 6d.; No. 3, 33s. 6d, and No. 4, 33s. Bessemer iron, f. o. b., Barrow, was quoted as follows: No. 1, 55s.; No. 2, 52s. 6d.; No. 3, 51s.

Steel Rails.—We only note a sale of 1000 tons of steel, at $45 at Amboy. There are, however, negotiations in progress for considerable quantities. The prices are very firm. We quote at mills at $42@$44. Our English advices state that a large quantity of steel rails has been sold at £4 6s. per ton (2240 lbs.) Without business, we quote iron rails here at $36@$37.

Old Rails.—We learn of a sale of 1500 tons, at $20.

Wrought Scrap.—This article is very scarce, and quoted at $22.50@$23.

Our Louisville correspondence under date of Feb 25th, notes a very firm market with increasing scarcity of some grades, but no change in prices. The following is from Cincinnati under the same date:

"Pig-irons are not in plentiful supply; pending the blowing in of furnaces, now out, this state of things will continue. Prices are very firm. The demand for immediate consumption is but moderate, but engagements for future deliveries can readily be made at full prices."

At Baltimore there is no change.

The following is from Pittsburg, Feb. 25th, 1879:

"The market continues moderately active for good brands of pig-iron, while weak and cold short irons remain dull and neglected. The tone of the market is somewhat stronger, owing to more favorable advices from the East, and there is less disposition on the part of sellers to contract for future deliveries. Quotations are unchanged."

Our Columbus (O.) correspondent, under date of Feb. 26th, writes as follows:

"The demand for pig-iron the past week has been fairly active. Some of the furnaces have sold ahead for several weeks. Unless the recent advance in prices and the prospect of a further advance should induce idle furnaces to blow in, the outlook is certainly more encouraging than for many months."

Philadelphia. Feb. 27, 1879.

[Specially reported by JUSTICE COX, JR., & CO., Iron Merchants, 333 Walnut street, Philadelphia.]

Pig Iron.—The brisk trade in the iron market continues. All small lots of cheap iron have disappeared from the market, and the advance of fully one dollar per ton is being mentioned. We report sales of about 5000 tons, and quote: No. 1, $17.50@$19; No. 2, $16@$18; Gray Forge, $16@$17.

Manufactured Iron.—The meeting of the Eastern Iron Association last Friday, in this city, brought together quite a number of millmen. The unanimous report was plenty of orders at present prices, with a determination to advance the prices and make a new list of extras. The bar millmen all refused more orders than at any time for the last five years, while plate and sheet mills have about all they can do, and refuse orders for future delivery. We quote: Bars, 1 7-10 to 2c., firm; plate and tank, 2⅞ to 6c. per lb.

Rails.—The steel rail mills continue to have all they can do at present prices. In iron rails, a good business is reported, and an advance of fully two dollars is reported. We quote steel, $41 to $44; iron, $34 to $36; all at mills.

Old Rails.—The demand for old rails is far in excess of the supply. Holders of old rails are holding firm for an advance; hence little business is reported. We quote, $20.50 to $21.50.

Scrap.—There is quite a demand for wrought and cast scrap. We quote wrought, $20 to $22; cast, $12 to $16.

METALS.

NEW YORK, Friday Evening, Feb. 28, 1879.

The business done during the past week was not very large. Many buyers are dissatisfied with prevailing prices, and are supplying only their most pressing necessities, but it is indicated that a very good demand must come soon, when, for a time at least, the sellers will control the situation.

RECEIPTS OF METALS AT NEW YORK FOR THE EIGHT WEEKS ENDING FEBRUARY 27TH AND YEAR FROM JANUARY 1ST, 1879.

	Feb. 6	Feb. 13	Feb. 20	Feb. 27	Year from Jan. 1.
Copper, bbls	201	177	151	57	1,250
Copper, boxes	.....	.....	.....	.....	.....
Copper, cakes	115	.....	247	807	2,416
Lead, pigs	6,945	4,896	4,002	2,409	21,551
Spelter, pieces	2,867	1,455	3,714	865	18,530
Quicksilver, flasks	.....	.....	.....	.....	.....

Copper.—The business has been very limited at 15½c., at which price the market closes firm. It is very evident that a large quantity of copper will have to be sent abroad, and the present indications are very unfavorable to our producers getting remunerative prices for such copper. Producers are now being prepared to meet the inevitable.

We have received the following from London under date of February 14th:

"Holders of Chili bars, finding that buyers were unwilling to pay the prices asked, have at last decided upon making the necessary concessions, and we therefore note business to the extent of about 300 tons, common marks selling at £55¼, cash; good and favorite brands at £55½ @£55¾, and best at £56@£56¼. There is still an inquiry for G. O. B.'s at the above figure (£55½), but, for the moment, no further quantity can be obtained at said rate. A cargo of 560 tons Peruvian ore has been sold to day at 10s. 6d. per unit, *ex* ship Liverpool. Nothing doing in Australian, Wallaroo cake being still £64½; Burra cake and ingot, £64."

Tin.—Straits in London has advanced to £64. The price was up to £64 10s. this week. Singapore and Penang both quote $20 per picul, with exchange at 3s. 8¼d. Supplies are scarce at the Straits, but fresh ones are soon expected. About 400 tons of Straits have been sold to arrive on the basis of 14¾@ 14⅞c. for January shipments, and 14¼@14½c. for February shipments. On spot, about 50 tons sold at 14¾@15c. L. & F is quoted in London at £66@£68. The sales here have been 15 tons, at 14¼c. Refined has sold to the extent of 15 tons at 14½@14¾c. The following were the closing quotations for spot lots: Straits, 15⅛@15¼c.; L. & F., 14½c.; Refined: 14¾@14⅞c.

Our London correspondence of February 14th says:

"Tin is quiet, and no transactions were reported, either in spot or for forward parcels. The former are quoted £59¼@£59½; the latter £59½.

Tin Plates have been rather quiet. We quote Charcoal, bright, ⅛ X, Melyn grade, $6.37½@$6.50, and Alloway grade, $6.25@$6.37½; charcoal ternes, Alloway grade, $5.75@$6; coke, bright, B. V. grade, $5.50, and coke, roofing, 14×20, $5.25.

The exports of tin plates from Great Britain to the United States in January were 8995 boxes as compared with 8466 boxes in the same month of 1878, and 7243 boxes in 1877.

Messrs. Robt. Crooks & Co., of Liverpool, under date of February 13th, say of tin and terne plates:

"During the past few days the advance, as far as regards coke tins, appears checked, and though lower prices are hardly obtainable, yet the feeling is a shade weaker. Charcoal tins, on the other hand, are much firmer, while ternes of good repute are difficult to buy for prompt shipment, and dear."

Lead.—We only learn of a sale of 70 tons of Richmond lead, from dock, at 4¼c., at which price the market closes.

Spelter and Zinc.—Ten cars of spelter were sold at 4½c. The quotations at the close range from 4⅝ @4¾c., according to quality. Sheet zinc is dull, at 6c. in a wholesale way, while in a jobbing way 6¼c. is asked. Bergen Port spelter is quoted at 9c.

Antimony is very quiet. Cookson's is quoted at 12¼c. and Hallett's at 11¾c.

Quicksilver.—The market is very sluggish at 39c., and some parties claim to have bought at 38@38½c. for prompt cash. The spot stock is large, and the home and foreign demand is light.

The quicksilver exports by sea from February 15th are as follows:

1781 flasks, valued at $53,845. Previously since January 1st, 3995 flasks, valued at $128,111.

	Flasks.	Value.
Totals since January 1st, 1879	5 776	$181,956
Totals, same period, 1878	3,587	121,284
Increase in 1879	2,189	$60,672

Receipts for the week ending February 20th, 1296 flasks. —*San Francisco Commercial Herald.*

The Phœnix Quicksilver mine in Pope Valley, Napa County, shipped seventy flasks (5355 pounds) of quicksilver to San Francisco during the month of January last.

THE BULLION MARKET.

NEW YORK, Friday Evening, Feb. 28, 1879.

The London market has fallen decidedly since our last, in consequence of lower rates of Eastern exchanges and offerings of the German government on

the rise to 50⅛d. We understand that the brokers for the German government were able to sell but a small amount before the market broke to rates at which they declined to sell. This disposition to sell, with large offerings from the United States, and lower India exchanges, seem to indicate, very decidedly, a further fall in silver. The markets close as follows: London, 49½d.; New York, $1.07¾; San Francisco, 18 per cent discount.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
Feb. 22	.....	.....	Feb. 26.	49⅝	108⅛
Feb. 24	50⅛	109	Feb. 27.	49½	107¾
Feb. 25	49¾	108⅜	Feb. 28.	49½	107¾

BULLION SHIPMENTS.

We give below a statement showing the latest bullion shipments in addition to those announced in our issue of February 22d:

February 10th	Tybo Con	Nev	4,277.54
" 14th	Highbridge	"	8,108.00
" 15th	Hillside	"	5,020.00
" 15th	Con. Virginia	"	41,696.70
" 15th	Ophir	"	45,454.09
" 15th	Northern Belle	"	6,545.00
" 15th	Alexander	"	7,816.00
" 15th	Manhattan	"	11,310.30
" 16th	Grand Prize	"	12,500.00
" 17th	Paradise Valley	"	3,390.00
" 17th	Independence	"	6,000.00
" 18th	Richmond	"	30,629.10
" 16th	Standard	Cal	16,656.00
" 18th	Bodie	"	14,050.00
" 11th	Christy	Utah	6,968.00
" 12th	Leeds	"	3,837.00
" 20th	Silver Reef	"	12,946.91
" 9th	Black Jack	Idaho	6,950.00
" 9th	W. D. Bigelow	"	3,300.00
" 9th	M. McGregor	"	2,644.03
" 9th	M. Oberdorfer	"	2,793.13
" 18th	Tip Top	Ariz	13,500.00

Government Silver Purchase.—SAN FRANCISCO, February 26.—The Nevada Bank to-day sold 100,000 ounces of fine silver to the Government, to be delivered at the San Francisco Mint at $1.08⅛ an ounce.

The Specie Exports from New York for the week ending the 22d of February amounted to $310,365.75.

January Bullion Yield of Pacific Coast Mines.—The following figures, showing the output of various producing mines for the month of January, 1879, are from the San San Francisco *Bulletin*:

"As the opening month of the year, the returns are of importance. California Gravel claims are doing but little at present for want of a sufficient supply of water. Some of the quartz claims have failed to send in any report for January. The gold claims make the following show:

Black Bear Quartz	$12,500
Bodie	85,300
Caledonia (Dakota)	11,500
Golden Terra (Dakota)	4 000
Idaho (Nevada County)	39,500
Murchie	7,000
Plumas Eureka	46,000
Standard ($7425 in silver)	102,200
Stewart	25,000
Total, nine gold mines	$333,000

"This is the first return from the Caledonia mine at Black Hills in some time. The claim was only opened last year, and the yield for 1878 was $13,800. The silver mines reporting give the following products:

Alexander	$25,800
Christy (Utah)	20,300
Eagle	9,300
Endowment	2,200
Extra ($2885 in gold)	14,400
Grand Prize ($3870 in gold)	80,600
Highbridge	43,500
Indian Queen	17,400
Kentuck	4,300
Leopard	1,800
Leeds (Utah)	12,800
Manhattan	72,800
Martin White	41,000
Ontario	63,300
Northern Belle	41,500
Paradise Valley	12,600
Raymond & Ely ($3153 in gold)	39,100
Silver King (Arizona)	36,000
Star	40,500
Tip Top (Arizona)	41,400
Total twenty silver mines	$620,600

"The bullion from the Kentuck mine is the first in a long time, and is the result of ore worked from the opening up of old levels. The Belmont, Panther, Modock Consolidated, McCrackin Consolidated, New Coso, K K Consolidated, Navajo, Comanche, and Bechtel Consolidated claims produced no bullion in January. The Paradise Valley mine is near Winnemucca, in Nevada, and is at present using the Rye Patch mill, which is crushing about 10 tons of ore daily. The Paradise is a silver mine, the bullion carrying only about 4 per cent gold. The gold and silver mines on the Comstock lode produced the following amounts in January:

	Gold.	Silver.	Total.
California	$174,900	$150,900	$325,800
Con. Virginia	65,500	74,200	139,700
Ophir	86,100	104,900	191,000
Trojan	8,400	8,000	16,400
Totals	$334,900	$338,000	$672,900

"The only productive base metal mines reporting are the Eureka Consolidated and Tybo Consolidated, both of which are yielding considerable gold and silver, as will be seen by annexed statement:

	Gold.	Silver.	Lead.
Eureka Consolidated	$98,300	$102,300	$64,900
Tybo Consolidated	5,300	52,500	11,100
Totals	$103,600	$154,800	$76,000

"The above list represents 35 mines, and the proportions of gold and silver produced by them during the fiscal month of January were as follows:

Gold mines	$325,600	
Gold with silver	344,000	
Gold with lead	103,600	$773,200
Silver mines	611,500	
Silver with gold	345,400	
Silver with lead	154,800	1 111,700
Value of lead		76,000
Totals		$1,960,900

"For the corresponding month last year, 28 mines reported a total of $4,849,800, while for the month of December, 1878, 40 mines reported $2,521,900."

From the 1st to the 18th of February the Standard Company have shipped four bars of bullion, amounting to $71,784.65, and the Bodie Company three bars, summing up $23,505.19; total for both mines, $95,286.84.

Official Yield of the Tuscarora District for the Quarter Ending December 31st, 1878.—The following report from the bullion producing mines of the county for the quarter ending December 31st, 1878, has just been returned to the Auditor of Elko County, Nevada:

Grand Prize mine, 1184 tons of ore.	
Value of ore per ton	$98.91
Total value	117,109.44
Navajo mine worked 1009½ tons.	
Average value per ton	$67.80
Total value	68,444.10
Independence mine, 2124 tons.	
Avarage value per ton	$42.31
Total value	89,866.44
Leopard mine, 1102½ tons of ore.	
Average value per ton	$40.39
Total value	44,529.98
Aggregate value of all ore worked	$319,949.90
Amount of bullion tax for the quarter	2,762.20

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to Feb. 28th, 1879

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Alexandria	.....	.....	.....
Allyn's Point	.....	.....	.....
Annapolis	.....	.....	.....
Baltimore	60	.....	.....
Bath, Me	.....	.....	.....
Boston, Mass	1.70@1.75‡	1.75	1.25@1.50
Braintree	.....	.....	.....
Bridgeport, Conn.	.....	1.50	.....
Bristol, R. I.	.....	.....	.....
Brooklyn	.....	.....	.....
Cambridge, Mass.	.....	.....	.....
Charleston	1.50	.....	.....
Chelsea	.....	.....	.....
Charlestown	.....	.....	.....
Cambridgeport	.....	.....	.....
Danversport	.....	.....	.....
East Cambridge	.....	.....	.....
East Boston	.....	.....	.....
Fall River	1.50	1.50	90
Fortress Monroe	.....	.....	75
Galveston	3.00	.....	.....
Georgetown	1.25	.....	.....
Hackensack	.....	.....	.....
Hartford	.....	.....	.....
Hoboken	.....	1.15@1.25	.....
Hunter's Point	.....	.....	.....
Jacksonville	.....	.....	1.50
Jersey City	.....	1.15@1.25	.....
Lynn	.....	.....	.....
Marblehead	.....	.....	.....
Middletown	.....	.....	.....
Newbern	1.20	.....	.....
New Bedford	.....	1.50	1.00
Newburyport	.....	2.00	.....
New Haven	.....	1.50	.....
New London	.....	1.50	.....
Newport	.....	.....	.....
New Rochelle	.....	.....	.....
New York	.....	1.45	.....
Newark	.....	1.60	.....
Norfolk, Va	.....	.....	75
Norwich	.....	1.60	.....
Norwalk, Conn	.....	1.50	.....
Pawtucket	.....	1.50	.....
Petersburg	1.45	.....	1.10
Philadelphia	.....	80	.....
Port Eades	.....	.....	.....
Port Royal	.....	.....	.....
Portland	.....	1.75	1.25
Portsmouth, Va.	.....	.....	.....
Portsmouth, N.H.	.....	1.85	.....
Providence	.....	1.50	1.00
Richmond, Va	1.10	.....	.....
Rockport, Mass.	.....	.....	.....
Saco	.....	.....	.....
Sag Harbor	.....	.....	.....
Salem, Mass.	.....	1.85	.....
Savannah	.....	.....	.....
St. John, N. B.	.....	.....	1.00
Trenton	.....	1.25	.....
Wareham	.....	1.50	.....
Washington	2.50	.....	.....
Wilmington, Del.	.....	80	.....
Wood's Hole	.....	.....	1.05

Perth Amboy to Wilmington, N. C., $2.

* And discharging and towing. † And discharging. ‡ And towing. § 3 cents per bridge extra.

FINANCIAL.

Coal Stocks.

NEW YORK, Friday Evening, Feb. 28, 1879.

The total transactions in coal stocks at the Philadelphia and New York Boards during the week just closed have aggregated 241,105 shares. Without exception, the prices at the close to-day mark a decline from those prevailing a week ago.

Delaware & Hudson records sales of nearly 3000 shares, at from 40⅝ to 43⅝, closing at 41, bid and asked. Delaware, Lackawanna & Western stock has ranged from 48, to-day, to 53¾, closing at 50, with sales of 106,140 shares. New Jersey Central stock exhibits a notable decline and considerable fluctuation in the prices, the extreme quotations showing a difference of 8 per cent, and the final price of 38½ a decline of 6 per cent for the week. The sales amount to 51,513 shares. We note a sale of 50 shares of the stock of the Pennsylvania Coal Co., at 136 per cent. Pennsylvania RR. stock has changed hands to the amount of 60,362 shares, at from 35⅞ to 35, closing at 35¼, and shows the steadiest feeling of any stock on the list. Reading marks transactions of 17,781 shares, at from 13⅝ to 12⅝, closing at 12¾. Lehigh Coal and Navigation and Lehigh Valley RR. stocks have been sparingly dealt in, with the prices at the close showing a weakening tendency.

The annual report of the Hampshire & Baltimore Coal Company shows a loss during 1878 of $3769.80.

A dispatch from Philadelphia, bearing date of Feb 25th, says:

"The annual meeting of the stockholders of the Lehigh Coal and Navigation Company was held here this morning. The report, a synopsis of which has already been published, was adopted. The subject of the agreement between the Delaware Division Canal Company and the Lehigh Company was taken up, when a resolution was adopted that 'the modification of the case of the Delaware Division Canal Company, as made by agreement dated Feb. 18th, 1879, subject to the approval of the stockholders of this company, and as explained by the communication from the President of the Delaware Division Canal Company, dated Feb. 17th, 1879, be and the same is hereby approved and confirmed.' The following officers were elected for the ensuing year: President, E. W. Clark; Managers, Francis R. Cope, Francis C. Yarnall, Fisher Hazard, Charles Parrish, Charles Wheeler, George Whitney, John Leisenring, James M. Willcox, Edward Lewis, T. Charlton Henry, Samuel Dickson."

The Receiver of the New Jersey Central Railroad has issued the following report:

NEW YORK, February 25, 1879.

To the Stockholders and Bondholders of the Central Railroad Company of New Jersey:

The following statement of earnings and expenses for the year 1878, as compared with the previous year, is respectfully submitted:

	1878.	1877.		
Passengers	$1,579,015.16	$1,530,639.74	Inc.	$42,375.42
Merchandise	1,361,486.48	1,283,823.61	Inc.	77,662.87
Coal	2,504,681.53	2,806,864.32	Dec.	302,182.79
Misc'lan'ous.	150,342.56	132,085.84	Inc.	18,256.72
Total	$5,539,425.73	$5,753,413.51	Dec.	$163,887.78
Expenses	3,286,756.28	3,268,567.04	Inc.	18,189.24
Net earn'gs	$2,302,769.45	$2,484,846.47	Dec.	$182,077.02

By the foregoing statement it appears that the income of the road from main line and branches and leased roads was $5,589,523.73. There was an increase in passenger receipts of $42,375.42; in merchandise freight of $77,662.87; in miscellaneous receipts of $18,256.72, and a decrease in coal freight of $302,182.79 as compared with 1877.

The road and equipment have been thoroughly maintained. All expenditures for the construction of new buildings, bridges, coal-trestles and piers, and for about twenty-eight miles of new steel rails laid during the year, as well as all legal and other disbursements incident to the reorganization of the company, have been included in the above statement of expenses. No additions whatever have been made to construction accounts.

By the united efforts and harmonious action of stockholders, bondholders, and creditors, which the Receiver desires to acknowledge, the success of the reconstruction scheme has been assured. Ten per cent on all the stock of the company has been paid by the stockholders. Two and one half years' coupons have been funded on $18,776,000 bonds out of a total of $19,400,000, leaving only $624,000 unassented.

All the "blanket" mortgage bonds, issued at the time of the receiver's appointment, amounting to $3,300,000, have been redeemed and canceled and the mortgage satisfied of record.

The resources of the company will be sufficient to meet current expenses, the installments on the extended loans secured by collateral, and all interest payments on its bonded debt as they mature during the present year.

F. S. LATHROP, Receiver.

AUCTION SALES.

Huntingdon & Broad Top Mt. RR. Co., $11,000 cons. mortgage bonds, at 32 per cent.

Reading RR. Co., $1200 scrip bonds, at 50 per cent.

Bethlehem Iron Co., $4000 first-mortgage 6s, at 90 per cent.

St. Louis, Iron Mt. & Southern RR. Co., $10,000 cons. mortgage 7 per cent bonds, due 1914, at 48½ per cent.

Hamburg Mining Co., of Eureka, Nev., 150 shares (hypothecated), at 25c. per share.

ANNUAL MEETINGS.

Delaware Water-Gap Slate Co.....March 5th.
Andover Iron Co .....11th.

Coupons and interest on the bonds of the following companies will fall due during the present month:

Belvidere Delaware RR. Co., 2d mortgage bonds; interest.

East Pennsylvania RR. Co., 1st mortgage bonds; coupons.

Lehigh Valley RR. Co., 7 per cent bonds; coupons.

Philadelphia & Reading Coal & Iron Co., 7 per cent debenture bonds (in default).

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	SHARES. No.	SHARES. Par Val.	Last Dividend. Mo.	Y.	A't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted, so much per share. Feb. 22. H.	Feb. 22. L.	Feb. 24. H.	Feb. 24. L.	Feb. 25. H.	Feb. 25. L.	Feb. 26. H.	Feb. 26. L.	Feb. 27. H.	Feb. 27. L.	Feb. 28. H.	Feb. 28. L.	SALES.
	$		$				Per c'nt													
Consol. Coal.	10,250,000	102,500	100	Jan.	77	2½	.....	.....	.....	42⅜	42¼	43⅜	42¼	42¾	40⅝	41¼	40½	41	41	2,935
Del. & H. C..	20,000,000	200,000	100	Aug	76	4	8	.....	.....	53¾	52½	53¼	52¼	52⅝	50½	51½	49⅝	51	48	106,140
D., L.&W. RR.	26,000,000	524,000	50	July	76	2½	5	.....	.....	15¾	15⅜	15¾	15¾	15¾	15⅜	15⅝	15⅜	15⅞	15⅝	1,833
Lehigh C.& N	1,.. ..8,850	208,971	50	Nov	76	1½	5½	.....	.....	35⅞	35¾	35¾	35¾	35¾	35⅜	35⅝	35⅜	35⅞	35⅝	483
Leh. V'y R. R	27,228,855	540,858	50	Dec	78	1	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryl'd Coal	4,400,000	44,000	100	Jan.	76	1½	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. R. R.	20,600,000	206,000	100	Apr	76	2½	2½	.....	.....	44½	42⅜	43½	42⅛	43	38½	39⅜	36½	39½	37⅞	51,513
Penn. Coal...	5,000,000	100,000	50	May	78	3	....	.....	.....	.....	186	.....	.....	.....	.....	.....	.....	.....	.....	50
Penn. R. R...	68,870,200	1,337,404	50	Nov	78	2	8	.....	.....	35⅞	35½	35⅝	35½	35⅝	35⅜	35¼	35	35⅜	35¼	60,332
Ph. & R. R. R	34,278,175	685,563	50	Jan	76	42¼	10	.....	.....	13⅜	12⅞	13⅛	13	13	12¾	12⅝	12⅜	12⅞	12¾	17,781

The Delaware and Hudson Canal Co. has paid in dividends to date $38,821,104, and the Philadelphia and Reading $43,012,497
Total Sales.....241 105.

Lehigh & Navigation Co., convertible gold 6 per cent bonds ; coupons.

Schuylkill Navigation Co., 1st mortgage 6s, reg. loan of 1897; coupons.

Pennsylvania RR. Co., cons. mortgage 6s, reg. of 1905 ; coupons.

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore, for the week ending the 28th ult. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.	Par Value.	High'st	Lowest	Closing	Sales: Shares.
American Coal Co.	$25	. . ..	.....	30	.....
St. L., I. M. & S. R. Co..	100	16	15½	15½	1,130
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co..	50	.....	.....	65	.....
*Penn. Salt Mf'g Co.	50	.....	.....	73½	.....
*Westm'land C. Co.	50	.....	.....	57	.....
*Buck Mt. Coal Co..	50	.....	.... ..	35	.....
*Schuyl. Nav. Co...	50	.....	.....	.....	.....
†B. & O. RR. Co. 1st pf	.....	103	102½	103	43
†B. & O. RR. Co. 2d pf	100	.....	.....	97	.....
" " " " com	90	96	95¼	95	55
†George's C'k C. Co	100	.....	.....	50	.....
†S. Clara M'g Co...	100	.....	.....	25	.....
†Atlantic Coal Co..	10	.....	.....	95	100

BONDS.	Princ'l. When Due.	Int'est. When Due.	Hig'st.	Lowest	Amount.
D., L. & W., 7s, conv	1891	J. & D.	.....	.....	.....
" " " " 2d mtge.	1882	M. & S.	.....	.....	.....
N. J. C., 1st mtge. new	1890	F. & A.	116½	116	$4,000
" " " 1st mtge., con	1899	Q.	87	82½	*595,000
" " " convt.....	1902	M. & N.	86	83	*123,000
Lehigh & W. B., con	1899	Q.	52¼	50	*197,000
Am. Dock & Imp. 7s	.....	J. & J.	64	.....	10,000
St. L. I. M. & S.. 1st mt	1892	F. & A.	111	.....	4,000
Ches. & O., 1st mtge	1899	M. & N.	.....	.....	.....
D & H C Co., 1stm.rg	1884	J. & J.	100	99	5,000
" " " " " "	1891	J. & J.	99½	.....	2,000
" " " " "m.loan cp	1894	A. & O.	101½	.....	5,000
" " " " " rg.	1894	A. & O.	.....	.....	.....
" " " " " new mge.	.....	.....	.....	.....	.....
*L. V. R., 1stm. 6s. cp.	1898	J. & D.	112	111½	6,000
" " " rg.	1898	J. & D.	.....	.....	.....
" " " 2d m. 7s, rg.	1910	M. & S.	.....	115½	.....
" " " con. m. 6s, rg	1823	J. & D.	102	.....	14,000
" " " 6s cp.	1923	J. & D.	101¾	.....	7,000
*Pa. RR., 1st m. 6s, cp	1880	J. & J.	.....	104¼	.....
" " g. m., 6s, cp.	1910	J. & J.	111½	.....	2,000
" " " 6s, rg.	1910	A. & O.	.....	113	.....
" " con. m. 6s, rg.	1905	Q.	.....	103½	.....
" " " 6s, cp.	1905	J. & D.	102	.....	3,000
" " new loan, 5s	.....	.....	113⅜	113¼	11,000
*P. & R. R., 1st m. 6s, R. C. 43-44.....	1880	J. & J.	.....	101	.....
P. & R. R., 1st m. 6s, R. C. 48-49.....	1880	J. & J	.....	.....	.....
P. & R. R., 2d m. 7s cp	1893	A. & O.	.....	115	.....
" " " scrip....	1882	J. & J.	50	49½	4,040
" " " in. m. 7s, cp	1896	J. & D.	.....	.....	.....
" " " c. m. 7s, cp.	1911	J. & D.	104	.....	5,000
" " " " 7s. rg.	1911	J. & D.	103¾	.....	5,000
" " " evt. 7s, R. C	1893	J. & J.	.....	50	....
" " C. & I. Co., Deb 7s, R. C.....	1892	M. & S.	.....	.....	... .
& R. C. & I. Co., m. 7s, R. C.....	'92-3	various	.....	.....	....
*L. Nav. Co., 6s, rg. m.	1884	J. & Q.	106⅞	.....	2,400
" " RR., rg. m.	1897	F. & Q.	107	.. .	1,200
" " evt. co. G. R.	1894	M. & S.	.....	.....	.....
" " " Gold R. C.	1897	J. & D.	95¼	.....	1,000
" " con. m. 7s, rg.	1911	J. & D.	.. . .	.....	.....
*P. & N. Y. C., 7s, R. C.	1896 / 1906	J. & D.	118	.....	1,000
*Pa Canal, 6s. cp..	1910	J. & J.	.....	65	.....
*Schuyl. Nav., 1st m. 6s. rg.....	1897	M. & Q.	.....	86	.....
*Sus. Coal, 6s, rg...	1911	J. & J.	92	.....	10,000
†Balt. & O. RR., 6s..	1880	J. & J.	.....	101	.....
" " " " 6s..	1885	A. & O.	...	106	.....
Total transactions for the week.....					$1,017,640

* Assented.

Gas Stocks.

NEW YORK, Friday Evening, Feb. 28, 1879.

There is nothing new to note in these stocks. Prices remain, with but a few exceptions, the same as last week, and it is safe to predict a firm market for some time to come. Bid prices are gradually creeping to a level with prices asked, there not being such a wide difference as existed some weeks ago.

Lighting New York.—The annual report of the Commissioner of Public Works has just been made public, and from it we extract the following data relative to the public lighting of the city : "The total length of gas mains in the city on December 31st, 1878, was eight hundred and twelve miles, of which there were laid during the year 1878 eighty-five and a half miles. The average number of lamps burning during the year was 21,419, and the total expenditures of the Bureau of Lamps and Gas was $498,801.56. The cost of lighting the city and public buildings during 1878 was less than for any year since 1863, although there has been an increase in that time of about six thousand lamps, and some additional expenditures during the last year for lighting armories and drill rooms, heretofore borne by the regiments. In 1874 the cost of this work was $757,009.60.

Lighting Pittsburg for 1879.—At a recent meeting of the Common Council of Pittsburg, Pa., $51,000 was appropriated for the public lighting of the city during the present year, against $57,000 for 1878.

The Trinity House, London, have found their recent experiments with a new gas for the purpose of lighting buoys, which are now useless after dark, so successful that they are having a number of buoys constructed after the new plan. The peculiarity of the gas is that a buoy full of it in a compressed state will keep a light burning for some months without need of replenishing. A lantern has been constructed in which the light is protected from spray at whatever angle it is placed. One of the lanterns, arranged on a buoy, was exposed off Trinity House wharf to the action of water from a fire engine, and it was found impossible to extinguish the light.

Prices of Gas in Ohio.—The prices for gas now prevailing in various places in Ohio are given in the following : Sandusky, Ashland, Circleville, Newark, Gallipolis, Urbana, Lima, Hamilton, Marietta, Piqua, Tiffin, each $3 ; Wooster, Ashtabula, Alliance, Akron, Chillicothe, Massillon, Portsmouth, Salem, Warren, each $2.50 ; Dayton, $2.55 ; Youngstown, $1.75@$2.35 ; Galion, Jonesville, $2.25 ; Cleveland, Columbus, and Cincinnati, $2.

Chicago Gas-Light and Coke Co.—We note the following : "By a resolution of the Board of Directors of this company, passed on the 21st day of February, it was ordered that 20 per cent of the aggregate amount of its outstanding bonds are hereby called in and ordered to be paid off, and the same will be redeemed at the office of the company on and after the 1st day of April, 1879, after which date the amount so called in will cease to bear interest."

The Westchester (Pa.) Gas Co. has reduced the price of gas to $2.80 per thousand.

The Bristol (Pa.) Gas Co. has reduced the price of gas to $3 per thousand.

The Circleville (O.) Gas Co. has reduced its rates to $2.75. Its friends advised a reduction to $2.50. Meanwhile, during cold weather, the quality of gas is execrable, and the quantity burnable greatly reduced by freezing of pipes, so that many of the merchants use oil in their stores.

MISCELLANEOUS SALES.

San Francisco Gas Co., 450 shares, at 90@89.
Oakland (Cal.) Gas Co., 400 shares, at 37.
People's Gas Co. (Baltimore), 10 shares, at 12⅞.
Consumers' Gas Co. (Baltimore), 100 shares, at 100.

AUCTION SALES.

East Boston Gas Co., 116 shares, at 30¾@29.
Boston Gas Co., 8 shares, at 730@722.
Exeter (Mass.) Gas Co., 36 shares, at 45.
South Boston Gas Co., 9 shares, at 109¾.
Chelsea Gas Co., 20 shares, at 77.
The Wellsville (O.) Council has contracted with the gas company of that place to furnish gas for 1879 at $15 per gas post.

The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York:

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	Am. of last.	Date of last.	QUOTATIONS Bid.	As'd.
	$		P. ct.				
Mutual, N. Y....	5,000,000	$100	6	1½	Jan., '79	72½	76
" Bonds...	90,000	1,000	6	3½	Feb., '79	95	100
N. York "	4,000,000	.....	8	4	Nov, '78	95	100
Metrop. "	2,500,000	100	10	5	Feb., '79	115	125
" Certfs...	1,000,000	.....	7	3½	Feb., '78	95	100
Harlem "	1,850,000	50	6	3	Feb., '78	40	50
Manhat. "	4,000,000	50	....‡	5	Feb., '79	176	180
Brooklyn, Bkln.	2,000,000	50	15	5	Jan., '79	135	140
Nassau	1,000,000	25	....‡	3	Jan., '79	70	75
" Certfs...	700,000	1,000	7	3½	Nov. '78	90	95
People's.....	1,000,000	10	....‡	3½	Jan., '79	20	30
" Certfs....	300,000	1,000	7	3½	Jan., '79	70	75
" Bonds....	325,000	.....	7	3½	May, '78	90	96½
Metrop. "	1,000,000	100	5	2½	Nov., '78	60	65
W'msb'g "	1,000,000	50	8	1½	Jan., '79	75	85
" Certfs...	1,000,000	.....	7	3½	Jan., '79	85	95
Citizens'.....	1,200,000	20	....‡	3	Jan., '79	60	70
" Certfs...	320,000	1,000	7	3½	Oct., '78	90	100
J. C., N. J.....	750,000	20	10	7½	Jan., '79	145	155
Municipal, N. Y.	466,000	50	.....	.....	.....	115	125
" Bonds..	750,000	.....	.....	.....	.....	95	....
.....	.....	.....	.....	.....	.....	.....	...

The following are receipts and shipments for week ending February 22d, 1879 :

Copper Stocks.

Reported by WILSON W. FAY & Co., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street.

BOSTON, Thursday Evening, Feb. 27, 1879.

The state of affairs in the market has had a favorable change during the week, the movements of the silver stocks being quite interesting, and causing more excitement on the street than has been manifested in these stocks for some time.

The small copper stocks have also been quite active, large lots changing hands, and most of them tending upward, and showing a better prospect of an active market. The large stocks are also quite strong, though not as active as the smaller ones.

Calumet & Hecla has held steady during the week at about 174, there being sales at that figure, and closes firm at 173½@174.

Copper Falls has rallied somewhat, and sold up to 1 1-16, there being large lots taken off the market at about 1.00, and closes firm at 1@1⅛.

Franklin remains quiet as yet, there being but little stock on the market, and closes firm at 3¾ @4¼.

Osceola is steady at 10¼@11¼, and appears quite firm.

Pewabic is stronger, having sold at ⅞, and closing steady at ⅞@1.00.

Quincy has advanced slightly, having sold at 11, and closes strong at 11@11½.

Ridge sold down to 62½c. for some unexplained reason, but has reacted, and is now firm at ⅞@1.00.

Duncan, contrary to the expectations of a great many, instead of falling off before the assessment became delinquent, has taken quite a jump, and sold up to 4¾ (assessment paid), being influenced probably by the good news from Silver Islet. It closes a little weaker, however, at 4⅝@4½.

International is also stronger at 45@50c.

Silver Islet astonished every body on the street by jumping up to 65 and selling at that figure, it being reported that they had struck the vein on the main land. It sold down to 54 since, and closes at 52@55.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Feb. 28, 1879.

There has been quite an active market for mining stocks during the past week.

The San Francisco stocks have had liberal attention. During the past two weeks Consolidated Pacific, of the Bodie District, has come into notice. The sales here since our last have amounted to 605 shares. The sales in the other stocks have been as follows: Bodie, 180 shares, at $7¼@$5¾ ; California, 200, at $7¾@$5⅝ ; Consolidated Virginia, 510, at $7½@$5⅝ ; Eureka, 50, at $29@$28 ; Grand Prize, 60, at $5¾@$4¼ ; Independence, 310, at $1.65@$1.60 ; Consolidated Imperial, 100, at $1.10 ; Julia, 110, at $5¾@$5 ; Navajo, 300, at 25c. ; Leviathan, 100, at 60c. ; Tip Top, 185, at $1.05@$1.20, and Tuscarora, 200, at 7c.

Mining stocks on the New York Stock Exchange have been rather quiet, but at the same time very firm. Homestake records 1056 shares, sold at $26¼ @$27¼, the last sale at $27. Reports from the mine are very favorable. Ontario has ranged between $39⅝ and $40⅛, with sales of 135 shares. The pump at the bottom of the shaft is again running. In Sutro Tunnel the dealings have amounted to 625 shares, at $3¾@$3½.

Plumas has been the most active of the regular list of the Mining Exchange. The sales amount to 4900 shares, advancing from $3 a week ago, to $3.65 yesterday, and selling at the last call to-day, at $3.30. The reports from the mine continue to be very favorable The late decline appears to have resulted from a bear attack, in which that animal got rather the worst of it. Findley has ranged from 56 to 54c., with sales of 3950 shares. Hukill records 595 shares, at $3@$2.80. Moose has been dealt in to the extent of 1835 shares, at $4.50@$4.30, notwithstanding the rather unfavorable report published by the company. New York & Colorado has been sold to the extent of 600 shares, at $1.50@ $1.55. Trio has been very quiet compared with a few weeks past, the sales amounting to 300 shares, at 70@55c.

Among the fancies, Bertha & Edith has been the leading speculation. The sales of this stock amount to 164,700 shares, at 12@20c. The higher price which was about the closing one, gives the whole property a value of $100,000, about as ridiculously high a price as we have ever seen in mining properties. There has been an effort to put up the price of Buckeye on the announcement that the King of the Valley mine had been added to the company's vast domains. The effect, so far, however, has not been very beneficial to the price of the stock. The sales for the week amount to 8100 shares, at 23@21c. The company has been a long time satisfying the public that it owns the King of the Valley, and our advice is to let the stock alone until some good evidence of ownership is given. The other dealings have been as follows: American Flag, 1700, at 23@21c. ; Dahlonega, 9700, at 18@16c. ; Gold Placer, 22,250, at 16@20c.

Messrs. Lounsbery & Hagin are rapidly disposing of the stock of the Standard Company, of the Bodie District, California. The price of the stock is now $22.50 per share. This mine, according to highly-indorsed expert authority, will pay 50c. per share per month,

for about three years, while it is expected that the dividend will be increased to $1 per month before the end of the year. All late advices indicate very active and satisfactory developments. A copy of the expert's report on this mine can be obtained at the office of Messrs. Lounsbery & Hagin, at 31 Broad street.

The stock of the Leadville Mining Company (Carbonate mine) sold to-day at $2.40@$2.50 per share. A recent discovery upon a property in front of the Carbonate claim, and which, under the decision of Judge Hallet in the Iron mine case, the Leadville company can hold, gives additional value to the stock. Although the robbing of this mine reported by us two weeks ago, and now freely admitted by the company, interfered with the operations of the new company, yet it is claimed that all has since been put to rights, and that a dividend of $20,000 or 1 per cent. has been earned, and will be announced to-morrow, payable probably on the 15th inst.

The mine is to be under the management of a superintendent from the Lake Superior copper mines, a gentleman highly spoken of.

Reports from Findley are again of a very favorable character. Both mills were started the beginning of this month, and it is expected that the March product will enable the company to resume dividends.

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS						Opening.
	Feb. 21.	Feb. 22.	Feb. 24.	Feb. 25.	Feb. 26.	Feb. 27.	Feb. 28.
Alpha	19¼	.....	20½	19	19¼	19	19
Alta	6⅜	.....	6¼	5⅞	5½	5½	5½
Argenta	.....	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	.....	.....	.....
Belcher	7¼	.....	6⅝	6½	6⅜	6¼	6½
Belle Isle	.....	.....	.....	.....	.....	.....	.....
Benton	.....	.....	.....	.....	.....	.....	.....
Best & Bel	22½	.....	23	21	21	19½	19½
BlackHawk	.....	.....	.....	.....	.....	.....	.....
Bodie	7¼	.....	7⅛	7	6¾	6	.....
Booker	.....	.....	.....	.....	.....	.....	.....
Bullion	7¾	.....	7⅞	7¼	7	6	6⅜
Bulwer	.....	.....	.....	.....	.....	.....	.....
Caledonia	2⅞	.....	2¾	2¾	2⅝	2⅝	2½
California	7⅜	.....	7⅛	6⅛	6⅛	6½	6½
Chollar-Pot	49	.....	47	47	47	46	46
Confidence	.....	.....	.....	.....	.....	.....	1.15
Con. Imp	.....	.....	.....	.....	.....	.....	6
Con.Va	7⅜	.....	6⅝	5¾	6	6	6
Crown P'int	5⅞	.....	5⅝	6	5	4⅞	5
Endowm'nt	.....	.....	.....	.....	.....	.....	.....
Eureka Con	29	.....	28½	27½	28	28	.....
Exchequer	7	.....	7⅛	6⅜	6⅛	5⅛	5⅜
Goodshaw	.....	.....	.....	.....	.....	.....	.....
Gould &Cur	13½	.....	14	12⅜	12⅜	11⅜	11½
Grand Prize	5	.....	4¾	4⅝	4⅞	4¾	.....
Hale & Nor.	17	.....	17½	15⅜	16	15½	15⅝
Hamburg	.....	.....	.....	.....	.....	.....	.....
Homestake	.....	.....	.....	.....	.....	.....	.....
Hussey	.....	.....	.....	.....	.....	.....	.....
Indep'd'nce	.....	.....	.....	.....	.....	.....	.....
Jackson	.....	.....	.....	.....	.....	.....	.....
Julia Con	5⅜	.....	6⅛	5⅜	5¾	5⅜	5¼
Justice	5⅞	.....	5	4⅞	4¾	4¼	4¾
Kentuck	.....	.....	.....	.....	.....	.....	5
Kossuth	.....	.....	.....	.....	.....	.....	.....
Leopard	.....	.....	.....	.....	.....	.....	.....
Leviathan	.....	.....	.....	.....	.....	.....	.....
Manhattan	.....	.....	.....	.....	.....	.....	.....
McClinton	.....	.....	.....	.....	.....	.....	.....
MeadowVal	.....	.....	.....	.....	.....	.....	.....
Mexican	41	.....	45¾	42½	45⅛	41½	44
Mono	.....	.....	.....	.....	.....	.....	.....
Navajo	.....	.....	.....	.....	.....	.....	.....
North. Belle	8⅛	.....	10	9	9¼	9¼	.....
Ophir	41	.....	44½	41¼	41¼	40	41
Orig. K'ys'e	.....	.....	.....	.....	.....	.....	.....
Overman	10¾	.....	10	10	9¾	9⅝	*12¾
P. Sheridan	.....	.....	.....	.....	.....	.....	.....
Ray. & Ely	6	.....	6¼	6	5	5	.....
Richer	.....	.....	.....	.....	.....	.....	.....
Savage	13⅞	.....	13¼	13⅛	13¼	13	13¼
Scorpion	.....	.....	.....	.....	.....	.....	.....
Seg.Belcher	.....	.....	.....	.....	.....	.....	27
Sierra Nev	49	.....	55	50	51¾	48¾	49½
Silver Hill	.....	.....	.....	.....	.....	.....	2¼
Silver King	.....	.....	.....	.....	.....	.....	.....
Summit	.....	.....	.....	.....	.....	.....	.....
Tioga	.....	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....	.....
Union Con.	71	.....	86½	79	81½	75¾	79
Utah	.....	.....	.....	.....	.....	.....	17½
Ward	.....	.....	.....	.....	.....	.....	.....
WashoeCon	.....	.....	.....	.....	.....	.....	.....
Wells Fargo	.....	.....	.....	.....	.....	.....	.....
Yel. Jacket	21½	.....	22¼	19¾	21	18¾	19½
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....

Assessment paid.

REVIEW OF THE SAN FRANCISCO MARKET.

With the exception of a material advance in the quotations of the new bonanzas and one or two other isolated exceptions, the San Francisco list exhibits a marked decline, contrary to the opinion of the San Francisco press, which has been predicting a rise.

The stock of the Addenda Mining Company, a Bodie stock, is selling on the San Francisco market at 70 cents per share, equal to $70,000 for the property. The total depth of the incline in this mine is now over 300 feet. It is stated that the ledge passed through is from 8 to 10 feet thick, all mineral-bearing quartz, assaying from $16 per ton up.

Alpha opens at $19. The flow of water from the face of the joint drift on the 2400-foot level (east) of this mine continues about the same, thereby preventing work at that point.

Belcher opens at $6½ against $7¼ last week. The ventilation on the 2560 level of this mine is said to be much improved by the connection made with the Crown Point.

Best & Belcher opens at $19⅞ against $23 a week ago. Progress in sinking the Osbiston shaft is very much interfered with by the strong flow of water. It is now down about 470 feet. A contemporary observes:

"When Belcher was selling at $3 per share, Segregated Belcher sold at $30. Now that Belcher is selling for $7¼, Seg. Belcher only brings $19½, and yet the drift in Belcher is now being run towards Seg. Belcher, on the 2300 and 2500 foot level. Why is this thusly?"

Belmont shows but limited dealings on the San Francisco market, at from 40 to 50c. per share. Recent letters from the mine state that the ore stopes are improving, and that the south stope, between the 200 and 300-foot levels, shows a continuous body of ore for 50 feet. The average assay of ten tons of assorted ore was $104,

Bechtel has been fairly active in San Francisco, at from 60c. to 85c. per share. This mine is troubled with water on the 700 level. Recent advices express the possibility of a suspension of operations on this level should the flow continue.

The stock of the Confidence Mining Co. has been quite active in San Francisco at from $15.50 to $19 per share.

Bodie closed yesterday at $6, against $7½ last week; this is the lowest price we have recorded for this stock for a long time past.

Bullion is lower. The station on the 2150 level of this mine is to be connected with the 2000 level of the Imperial by the 1st of March. On the 2400-foot level the combination Bullion-Exchequer drift has been advanced a total length of about 175 feet. The formation still continues in the same favorable character.

The old bonanzas still continue to decline, California opening at $6½, and Virginia at $6. At the present selling price of these stocks both of these properties may be purchased for less than $7,000,000, which would be a low figure if half of what we see stated about ore reserves, etc., is true.

It is said that the Nevada Bank has called in all loans on California and Consolidated Virginia stocks. To this is partially attributed the decline noted in the prices of these stocks.

The connection which has been made between the north drift from the C. and C. shaft on the 2150 level and the south drift from the 2000 level of the Ophir is thought to be one of great importance to the mines through which it passes. Not only will it cause the circulation of a great current of air between the C. and C. and the Ophir shafts, but it will also allow of comfortable and economical prospecting in large sections of very promising and hitherto unexplored ground in both the Ophir and California claims.

Consolidated Pacific, a Bodie stock, has been fairly active on the San Francisco market at from $1.45 to $1.80 per share, according to latest mail advices, although a quotation by telegraph to-day is $2.15.

Chollar-Potosi is decidedly lower. Sinking the Chollar Combination shaft is progressing satisfactorily, considering the large flow of water to be contended with.

Crown Point opens at $5, a decline of $1 for the week.

Exchequer is down $1 per share.

Eureka Consolidated stock is still on the decline, closing yesterday at $28, against $29 a week ago. This company has completed its shaft from the twelfth to the thirteenth level, and is now drifting north for the mine, which will require about one or two weeks from now to reach. The upper levels continue to look well, and are furnishing the usual amount of ore. The furnaces are running nicely and making a large quantity of bullion.

On the 1100-foot level of this mine the ore-body is reported as looking very well, and on the 1200 level it is widening out and growing stronger.

Preparations have been made for the starting up of operations on the Goodshaw mine. This stock is quoted in San Francisco at 50c. per share and fairly active.

Gould & Curry is down $2 per share. The water in this mine is very strong, and the slightest stoppage of the pumps seriously interferes with the progress of the work.

Grand Prize is weaker. Recent information from this mine is to the effect that the principal work is confined to the extraction of ore from the upper levels and running the west drift on the 320 level. The new machinery is up and running very well, and the company is making satisfactory shipments.

Hale & Norcross is lower, and the operations at the mine are checked by reason of the water. On the 17th of February a pump-rod broke, with the usual consequences attending such accidents on the Comstock.

We have no quotation for Independence. The stock has been fairly active on the San Francisco market, from $1.70 to $2.05 per share. It is said that the mine is looking well and yielding about 20 tons of ore per day. If the management were such as to inspire confidence, this stock would be worthy of attention.

Julia is $1 per share lower, but is troubled, like nearly all the rest, with water.

Justice is lower.

Mexican and Ophir have both improved, the former advancing $3 per share, and the latter $1.

Northern Belle has advanced, closing yesterday at $9¼, against $8¼ a week ago. This company continues its regular shipments of bullion.

Overman has advanced to $12¾, against $10¾ last week, with the assessment of $3 per share paid. Recent advices from this mine state that they are very much troubled with water.

Raymond & Ely is $1 per share lower. An increased flow of water has been encountered in this mine. A new pump, however, is in course of erection, when no more trouble from this source is anticipated. The company's mill has been running on tailings recently with very satisfactory results.

Savage is unchanged. This company is putting in some massive machinery, the compressor which has been received at the mine being the largest on the Comstock.

The new bonanzas have taken an unexpected start during the week, Sierra Nevada reaching $55, on the 24th inst., and Union Consolidated $86½ on the same date, from which prices, however, a decline of $5½ and $7½ per share respectively, has occurred. The flow of water in the Union Consolidated has decreased somewhat. Active work is being prosecuted in all parts of both of these mines.

Yellow Jacket is lower.

No arrangements seem to have been effected thus far between the Sutro Tunnel and the several mines, but it is understood negotiations are progressing with that object.

The *Commercial Herald* says of the market: "The mining stock market is not as strong as it was during the previous week, either in price or in the aggregate transactions. The sales of those claims in which such a deep interest manifested itself recently have not been as large, and until better evidence of an improvement in prospects for the future is obtained we can hardly expect a very general movement for a booming market. Every body is looking for an active market in the spring, not alone in the Comstock mines, but in a number of the other largely increasing bullion-producing districts—mines upon which we must principally even now rely for the yield of the precious metals. These stock, we believe, will take a very prominent position during the current year; in the meantime the wild cats remain in the market, and large amounts are constantly changing hands. Ophir shows some improvement under increased sales. Sierra Nevada has been selling slowly at well-maintained prices. Work is vigorously carried on in the lower levels. The main south incline is now 30 feet below the 2300 station, running in cap rock and quartz."

NEW INCORPORATIONS.

We note the recent organization of the following companies in addition to those announced in our issue of February 1st, 1879:

Argo Mining Co	Cal	$1,000,000
Bechtel Cons. Mg. Co	"	10,000,000
Chief of the Hill Mg. Co	"	500,000
Chimney Peak Gold Mill and Mg. Co.	"	1,400,000
Diamond Creek G. and S. Mg. Co	"	5,000,000
Ferguson Con. Mg. Co	"	5,000,000
Great Hope Mg. Co	"	10,000,000
Jennie June Mg. Co	"	5,000,000
Monte Christo Gold Mg. Co	"	10,000,000
Montezuma Mg. Co	"	10,000,000
Park's Bar River Mg. Co	"	10,000,000
Rainbow Gold Mg. Co	"	500,000
Rich Hill Cons. Mg. Co	"	3,000,000
Standard Cons. Mg. Co	"	10,000,000
Walker Mill and Mg. Co	"	3,000,000
Chloride Flume Co	Col	10,000
Inter-Ocean Mining Co,	"	10,000
Leadville Smelting Co	"	50,000
Michigan G. and S. Mg. Co	"	40,000
Alaska Cons. Mg. Co	"	2,000,000
Forsyth G. and S. Mg. Co	Ariz	10,000,000
South Oro Mg. Co.	"	10,000,000
Taled Mg. Co	Ill	150,000
Ohio Coal Mg. Co	Ohio	50,000
Cortes Cons. Mining Co		10,000,000
Cleveland and Montana Mg. Co		
Representative G. and S. Mg. Co		10,000,000

Assessments, with dates when delinquent: Day, 5c., March 15th; Diana, 10c., March 17th; Mammoth, 25c., March 19th; Jupiter, 10c., March 18th; Modock Consolidated, 50c., March 24th; Oriental, 50c., March 24th; Bechtel, 10c., March 25th.

The Mackey Gold and Silver Mining Co. has increased its capital stock from $5,000,000 to $10,000,000.